HIGHLIGHTS

REVISION NO. 33 Jun 01/10

Pages which have been revised are outlined below, together with the Highlights of the Revision

CH/SE/SU C PAGES	REASON FOR CHANGE	EFFECTIVITY
CHAPTER 78		
L.E.P. 1- 3	Revised to Reflect this revision indicating new,revised, and/or deleted pages	
T. OF C. 4	Revised to reflect this revision	
78-30-00 204, 209	Minor additions and amplification DELETED MPD REFERENE.	
78-31-00 510, 516, 524, 529- 533	Layout improved	
78-32-12 501, 504	Minor additions and amplification REVISED WORDINGS.	
78-32-13 401	Minor additions and amplification REVISED DESIGNATION OF PUSH-PULL GAGE.	
78-32-13 601, 603, 607- 608	Minor, non technical corrections CORRECTED TYPO ERROR.	
78-36-03 401- 402, 407	Minor additions and amplification REVISED DESIGNATION OF PUSH-PULL GAGE.	
78-36-03 601, 603- 604	Minor additions and amplification REVISED DESIGNATION OF PUSH-PULL GAGE AND INSP/ADJUST OF FORWARD CIRCUMFERENTIAL STRAP LATCHES. Layout improved	
78-36-04 601	Minor additions and amplification REVISED DESIGNATION OF PUSH-PULL GAGE.	

CHAPTER 78

EXHAUST

LIST OF EFFECTIVE PAGES

N, R or D indicates pages which are New, Revised or Deleted respectively
Remove and insert the affected pages and complete the Record of Revisions and the Record of Temporary Revisions as necessary

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RECORD			
OF TEMP.			
REVISION			
L.E.P.	R	1- 3	Jun01/10
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T. of C.		3	Jun01/08
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78-10-00		1	Jun01/04
78-10-00		2	Jun01/04
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78-30-00		4	Jun01/04
78-30-00		5	Jun01/04
78-30-00		6	Jun01/04
78-30-00		7	Jun01/04
78-30-00		8	Jun01/06
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EXHAUST

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Deactivation/Reactivation			901	101-200,
Ref. : MMEL Sect. 1-78, Item 4 (Thrust Reversers Blocker Doors)			901	101-200,
Ref. : ICDL Sect. 1-78, Item 1 (Thrust Reverser Track Fairing)			904	101-200,
Ref. : ICDL Sect. 1-78, Item 2 (Blocker Door)			904	101-200,
Ref. : ICDL Sect. 1-78, Item 3 (Blocker Door Link)			907	101-200,
Ref. : ICDL Sect. 1-78, Item 4 (Blocker Doors)			909	101-200,
THRUST REVERSER TRANSLATING SLEEVES	78-32-11			
Maintenance Practices			201	101-200,
Manually Deploy and Stow Translating Sleeves			201	101-200,
Removal/Installation			401	101-200,
Adjustment/Test			501	101-200,
Inspection/Check			601	101-200,
Inspect Thrust Reverser Translating Sleeves			601	101-200,
Inspect Thrust Reverser Translating Sleeve Seals			601	101-200,

SUBJECT	CH/SE/SU	C	PAGE	EFFECTIVITY
THRUST REVERSER CASCADES	78-32-12			
Removal/Installation			401	101-200,
Adjustment/Test			501	101-200,
Inspection/Check			601	101-200,
THRUST REVERSER BLOCKER DOORS	78-32-13			
Removal/Installation			401	101-200,
Inspection/Check			601	101-200,
Inspect Thrust Reverser Blocker Doors			601	101-200,
Approved Repairs			801	101-200,
BLOCKER DOOR LINK ASSEMBLY	78-32-14			
Removal/Installation			401	101-200,
Inspection/Check			601	101-200,
Equipment and Materials			601	101-200,
Procedure			601	101-200,
Inspect Blocker Door Link Assembly			601	101-200,
THRUST REVERSER CASCADE SUPPORT FRAME ASSEMBLY	78-32-16			
Removal/Installation			401	101-200,
Aft Support Frame Assembly of the Thrust Reverser Cascades			401	101-200,
Inspection/Check			601	101-200,
Inspection of Thrust Reverser Cascade Support Frame Assembly			601	101-200,
Inspection of Thrust Reverser Track Beam Lug Bearing Ball			602	101-200,
THRUST REVERSER DRAIN TUBE	78-32-38			
Removal/Installation			401	101-200,
THRUST REVERSER DOOR OPENING MECHANISM	78-36-00			
Description and Operation			1	101-200,
General			1	101-200,
Component Location			1	101-200,
THRUST REVERSER DOOR OPENING ACTUATOR	78-36-01			
Removal/Installation			401	101-200,
THRUST REVERSER DOOR OPENING ACTUATOR MANIFOLD	78-36-02			
Removal/Installation			401	101-200,
FORWARD CIRCUMFERENTIAL LATCH ASSEMBLY	78-36-03			
Removal/Installation			401	101-200,
Inspection/Check			601	101-200,
Inspect Forward Circumferential Strap and Retaining Clips			601	101-200,
R Inspect and Adjust Forward Circumferential Strap Latches			601	101-200,
AFT CIRCUMFERENTIAL AND THRUST REVERSER COWL LATCH ASSEMBLIES	78-36-04			
Removal/Installation			401	101-200,
Inspection/Check			601	101-200,
Inspect Thrust Reverser Door Bifurcation Latches			601	101-200,
Inspect and Adjust Aft			602	101-200,

SUBJECT	CH/SE/SU	C	PAGE	EFFECTIVITY
Circumferential Strap Latch and Load Share Toggle				
THRUST REVERSER DOOR HOLD-OPEN RODS	78-36-05			
Servicing			301	101-200,
Clean Thrust Reverser Door Hold-Open Rods.			301	101-200,
Lubricate Thrust Reverser Door Hold-Open Rods.			301	101-200,
Removal/Installation			401	101-200,
PRECOOLER SUPPLY DUCT	78-36-10			
Removal/Installation			401	101-200,

EXHAUST - GENERAL - DESCRIPTION AND OPERATION

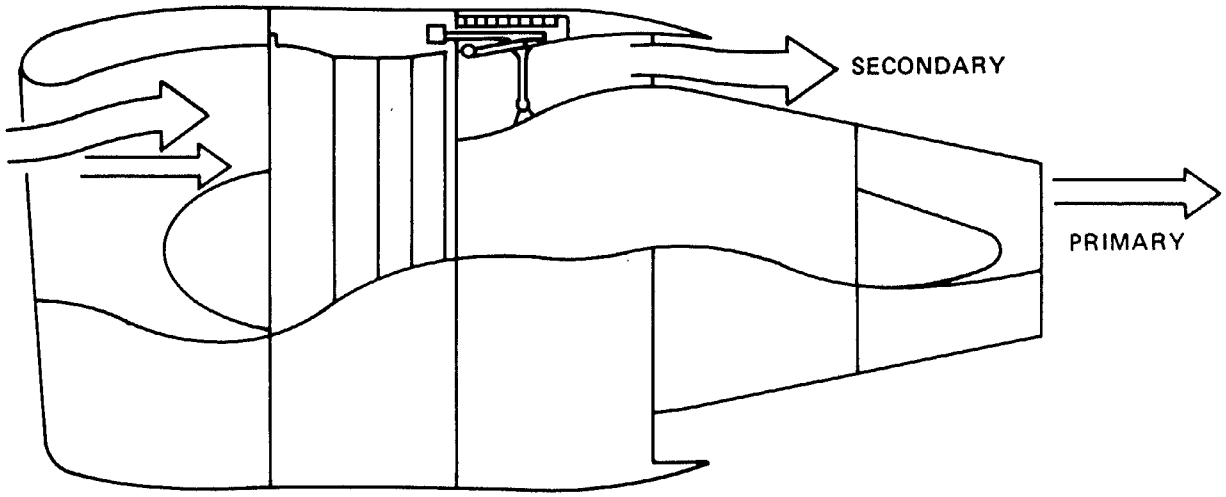
1. General (Ref. Fig. 001)

The engine exhaust is an essential part of the nacelle with regard to the engine thrust obtained from the engine. Its shape has to be aerodynamically optimized.

The exhaust system consists of :

- the primary nozzle for the turbine gases,
- the secondary nozzle for the fan air (Ref. 71-13-00, P. Block 1).

It consists of the inner fan duct and of the thrust reverser sleeves. When the thrust reverser is used the secondary air stream is exhausted through the cascades. The exhaust system is acoustically treated and the turbine exhaust is designed to resist severe ambient conditions.



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Exhaust
Figure 001

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COLLECTOR/NOZZLE - DESCRIPTION AND OPERATION

1. General

A. Exhaust Nozzle (Ref. Fig. 001)

The exhaust nozzle is a tapered cylindrical structure attached to the turbine exhaust case rear flange T. The forward outer surface is flush with the thrust reverser inner duct outer surface. The nozzle inner surface, in conjunction with the engine exhaust plug, establishes the cross sectional area of the turbine exhaust nozzle and forms the outer contour of the exhaust annulus.

The nozzle construction consists of an aluminum skin outer barrel and frames, a brazed Inconel honeycomb inner barrel and an Inconel double-wall tailpipe. The inner barrel inner face surface is perforated for sound attenuation.

Nozzle attachment handware includes a T.shaped ring around the forward end of the nozzle. This ring is a key component of the cowl loadshare system, which helps prevent engine case distortion due to flight loads. The T-ring is the bearing surface for the aft end of the thrust reverser structure.

B. Engine Exhaust Plug

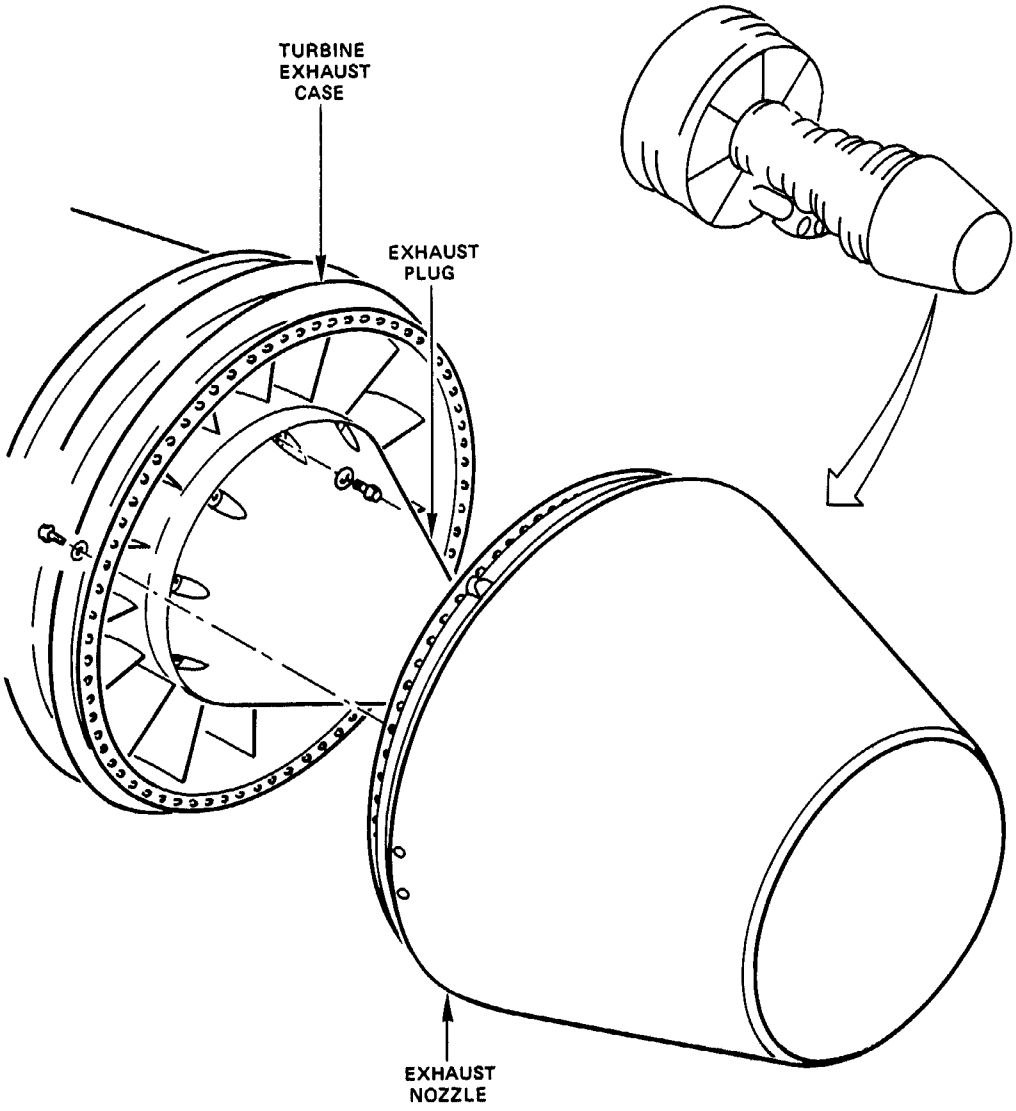
The engine exhaust plug is bolted to the rear inner flange T1 of the turbine exhaust case. The plug forms the inner contour of the exhaust annulus.

The plug is constructed of a welded sheetmetal Inconel panel, an attachment ring and a closure cone.

2. Component Location

(Ref. Fig. 001)

FIN	FUNCTIONAL DESIGNATION	PANEL	ZONE	ACCESS DOOR	ATA REF.
	NOZZLE - EXHAUST, ENG1 (ENG2)		455		78-11-01
			456		
			465		
			466		
	PLUG - EXHAUST, ENG1 (ENG2)		455		78-11-02
			456		
			465		
			466		



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Collector/Nozzle - Component Location
Figure 001

ENGINE EXHAUST NOZZLE - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breaker Safety Clips
C.	Torque Wrench
D. RSE1011	Dolly-Primary Nozzle
E. RSE1022	Fixture - Primary Nozzle
F. RSE1102	Cover-Primary Nozzle
G. Material No.P03-005	Oils (Ref. 70-00-00)
Referenced Procedure - 71-13-00, P. Block 301	Cowl Doors

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open thrust reverser cowl doors. (Ref. 71-13-00, P. Block 301).
(2)Install access platform

B. Removal (Ref. Fig. 401, 402)
(1)Using a forklift, lift the RSE1022 Nozzle Fixture under the nozzle (5). Align the forward and aft locations of the nozzle with the fixture supports.
(2)Wrap the nozzle (5) with two straps (Ref. Fig. 401) and tightly secure the nozzle to the fixture.
(3)Remove the bolts (10) and washers (15) attaching the nozzle (5) to the engine attach flange.
(4)Remove the bolts (20) and washers (15) from holes 36 and 37.
(5)Remove the nozzle (5) and fixture from the engine and place the fixture on the RSE1011 Dolly.

C. Installation
CAUTION : MAKE SURE NOZZLE IS THE CORRECT CONFIGURATION FOR THE ENGINE AND THE THRUST REVERSER YOU HAVE INSTALLED. AS A RESULT OF THE INCORPORATION OF SB PW4ENG 72-756 OR PW4ENG 72-759, MODIFICATION OF THE HPC TO INCORPORATE A RING CASE CONFIGURATION (RCC), IT IS NOT ACCEPTABLE, DUE TO WEIGHT RESTRICTIONS, TO INSTALL A POST SB 72-756 OR SB 72-759 ENGINE ON-WING IN COMBINATION WITH A THRUST REVERSER IMPROVEMENT PROGRAM (TRIP) CONFIGURATION THRUST REVERSERS (S/N 0714001 AND ON) AND INCONEL EXHAUST NOZZLES (S/N 1 THROUGH 0744001) IF ANY OF THE FOLLOWING OPTIONS ARE INCLUDED ON THE NACELLE : SCU, ACOUSTICALLY TREATED INLET OR ACOUSTIC PLUG. REFER TO INSPECTION SB PW4NAC 78-111 THAT DEFINES THE DISALLOWED COMBINATIONS WHICH WILL RESULT IN AN UNACCEPTABLE PROPULSION SYSTEM WEIGHT.
(1)Make sure that the nozzle (5) is positioned on RSE1022 Fixture with the index pin a the 9 O'clock position (looking forward). Using a forklift,

lift the nozzle and fixture to the engine attach ring.

(2)Remove the existing electrical harness guide bracket to get access to bolt holes 36 and 37.

(3)Loosen the fixture straps and align the nozzle (5) with the engine flange. Align the mating index pin with the index hole in flange T.

NOTE : (Ref. Fig. 402) for installation of the bolts. Six holes (Numbers 6, 15, 25, 38, 47 and 56) are not used.

(4)Attach the nozzle (5) to the engine flange with the bolts (10) and washers (15). TORQUE the bolts to between 63 and 70 lbf.in. (0.71 and 0.79 m.daN) using the opposite tightening sequence.

(5)Apply Material P03-005 to the threads of the bolts (20). Install the bolts and washers (15) in holes 36 and 37. TORQUE the bolts to between 100 and 115 lbf.in. (1.13 and 1.30 m.daN).

(6)Apply Material P03-005 to the threads of the bolts removed earlier from the harness guide bracket and reinstall the harness guide bracket in its original location. TORQUE the bolts to between 27 and 30 lbf.in. (0.31 and 0.34 m.daN).

(7)Remove the RSE1022 Fixture from the engine exhaust nozzle.

D. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

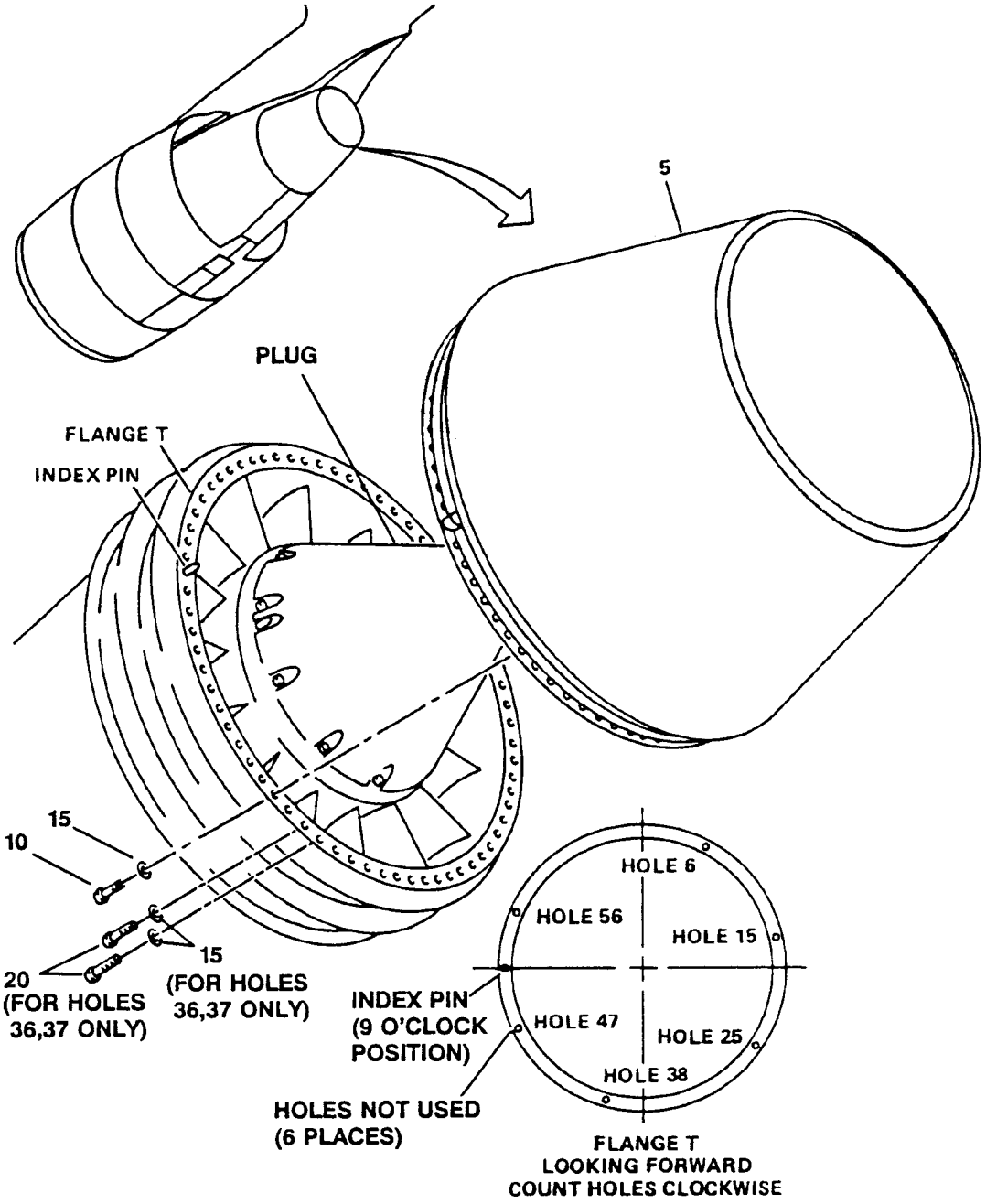
(2)Remove access platform

(3)Close thrust reverser cowl doors. (Ref. 71-13-00, P. Block 301).

(4)Inspect and, if necessary, adjust cowl doors to maintain cowl loadshare (Ref. 71-13-00, P. Block 301).

(5)Remove safety clips and tag and close circuit breakers.

NOTE : Install nozzle cover RSE1102 if aircraft is not being returned to service.



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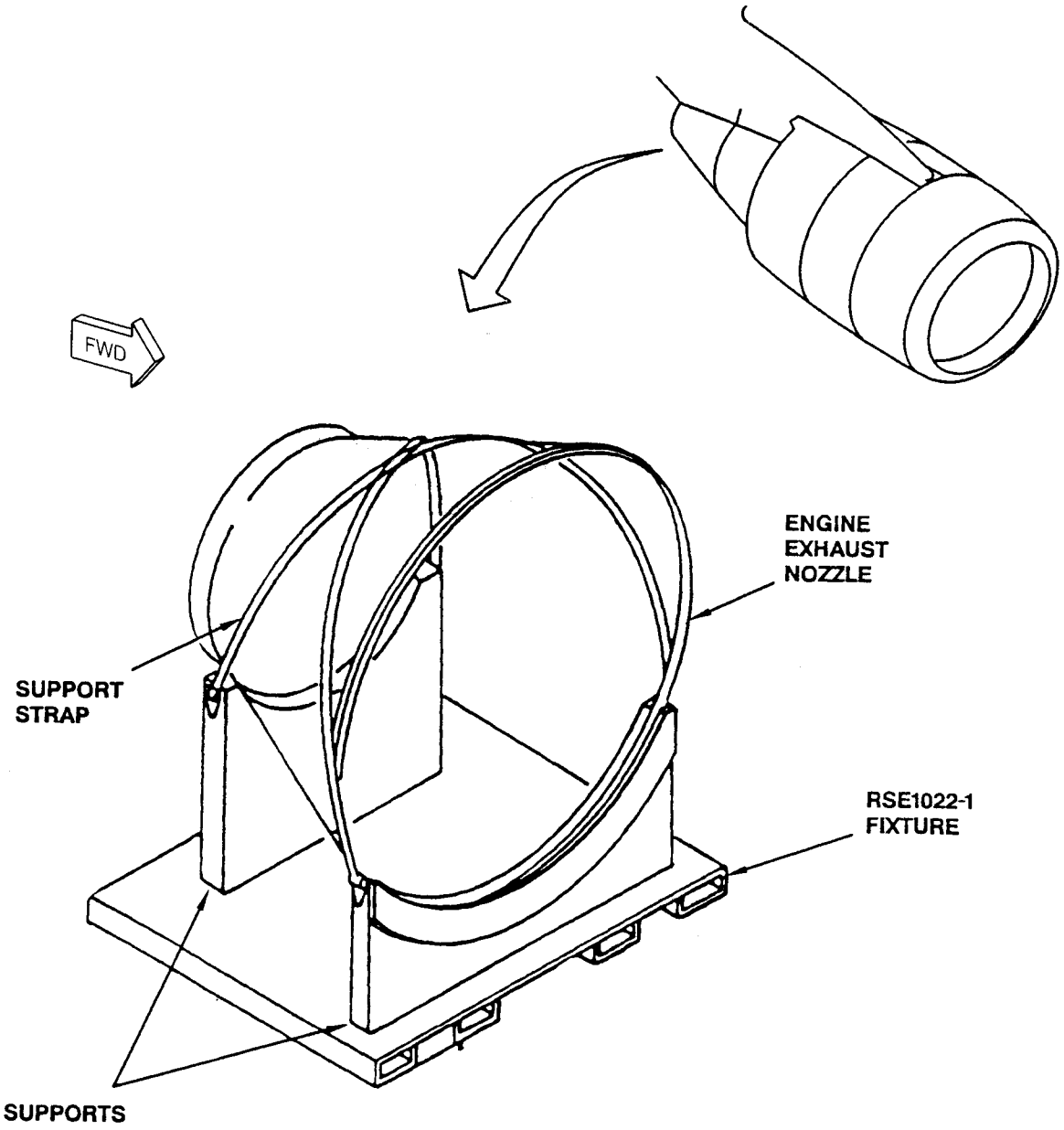
Engine Exhaust Nozzle
Figure 401



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-Aft Fairing Nozzle Seal-
Figure 402

1. Inspect Engine Exhaust Nozzle

A. For damage limits (Ref. 71-00-00, P. Block 601).

ENGINE EXHAUST PLUG CONE - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breaker Safety Clips
C.	Torque Wrench 0 - 150 lbf.in. (0 - 1.69 m.daN)
D. RSE1012	Support Exhaust Plug Cone

Referenced Procedure

- 71-13-00, P. Block 301	Cowl Doors

2. Procedure

A. Job Set-Up
(1)Install access platform.
(2)Open, safety and tag the following circuit breakers for the appropriate engine :

PANEL	SERVICE	IDENT.	LOCATION
133VU	ENGINES/ENG2/REVERSE/CTL	2KM	331/V74
133VU	ENGINES/ENG1/REVERSE/CTL	1KM	332/U69
133VU	ENGINES/ENG1/FUEL HP VALVE/CTL	3KC	333/T69
133VU	ENGINES/ENG2/FUEL HP VALVE/CTL	4KC	333/T70
133VU	ENGINES/ENG 2/IGNITION/SYS A	8JH	333/T71
133VU	ENGINES/ENG1 & 2/IGNITION/SYS B	2JH	333/T72
133VU	ENGINES/ENG1/IGNITION/SYS A	1JH	334/S72
133VU	ENGINES/ENG 1 & 2/START/CTL & WARN	1KG	335/R68

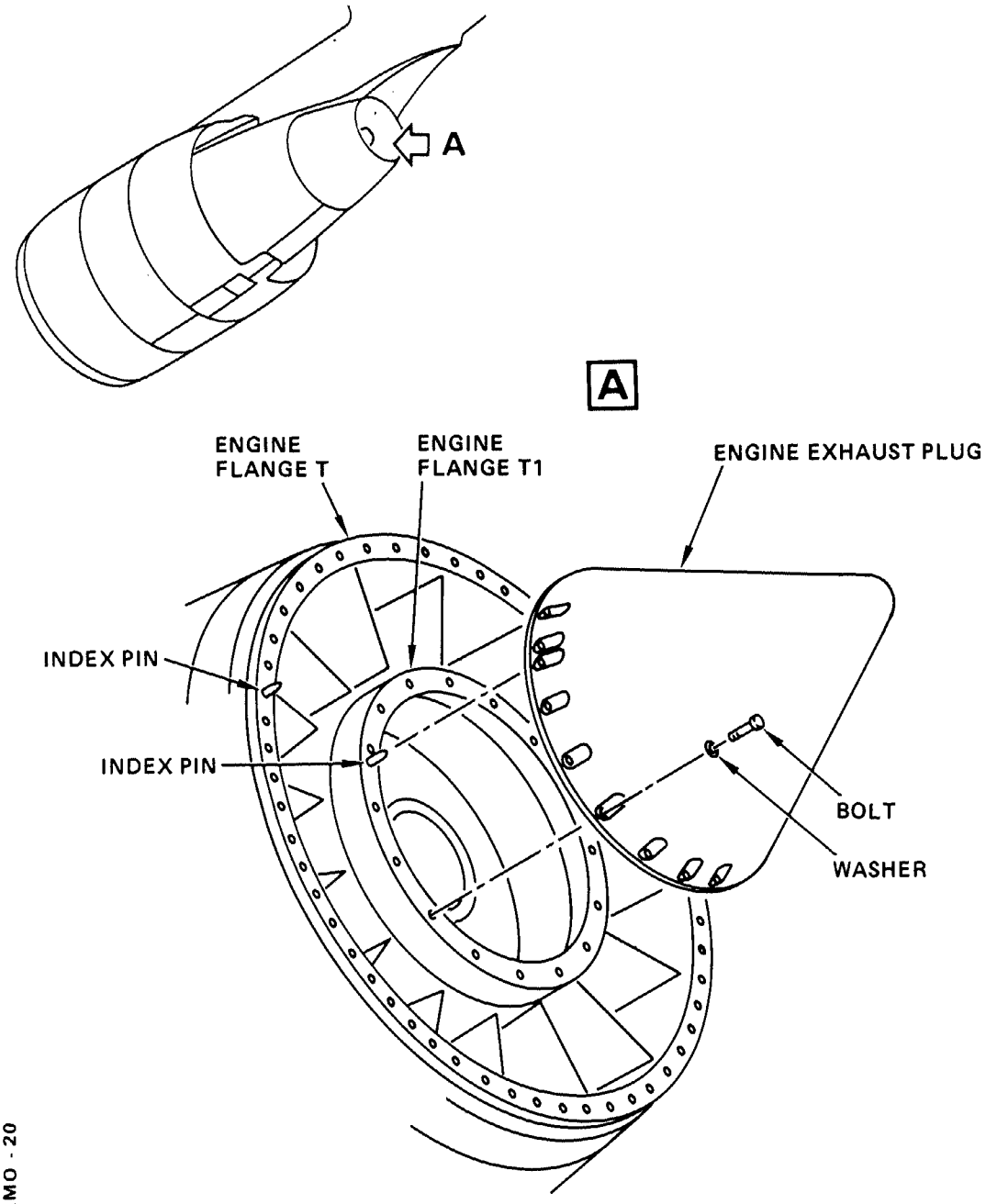
B. Engine Exhaust Plug Cone without Plug Adapter (Ref. Fig. 401)
(1)Removal
(a)Position RSE1012 support under plug.
(b)Remove bolts and washers attaching plug to engine flange.
(c)Remove exhaust plug and support from engine.
(2)Installation
(a)Position RSE1012 support and engine exhaust plug at engine exhaust Flange T1.
(b)Align plug index hole with Flange T1 index pin.
(c)Install five upper bolts, and washers attaching plug to engine Flange T1.
(d)Remove plug support fixture and install remaining bolts, and washers. TORQUE bolts to between 100 and 115 lbf.in. (1.13 and 1.29 m.daN) using opposite bolt tightening sequence.

C. Engine Exhaust Plug Cone with Plug Adapter (Ref. Fig. 402)
(1)Removal
(a)Position RSE1012 support under plug.
(b)Remove bolts and washers attaching plug to plug adapter on Flange T1.

(c)Remove exhaust plug and support from engine.
(d)Remove bolts and washers attaching plug adapter to engine Flange T1.
(e)Remove plug adapter from engine.

(2)Installation
(a)Position plug adapter at engine exhaust Flange T1.
(b)Align plug adapter index hole with flange T1 index pin and install with bolts and washers. TORQUE bolts to between 63 and 70 lbf.in. (0.72 and 0.79 m.daN), using opposite bolt tightening sequence.
(c)Position RSE1012 support and engine exhaust plug at plug adapter flange.
(d)Align plug index hole with index pin on plug adapter.
(e)Install three upper bolts and washers attaching plug to engine Flange T1.
(f)Remove plug support fixture and install remaining bolts and washers. TORQUE bolts to between 63 and 70 lbf.in. (0.72 and 0.79 m.daN) using opposite bolt tightening sequence.

D. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Remove access platform.
(3)Remove safety clips and tags and close circuit breakers 1KG, 1JH, 2JH, 8JH, 4KC, 3KC, 1KM and 2KM.



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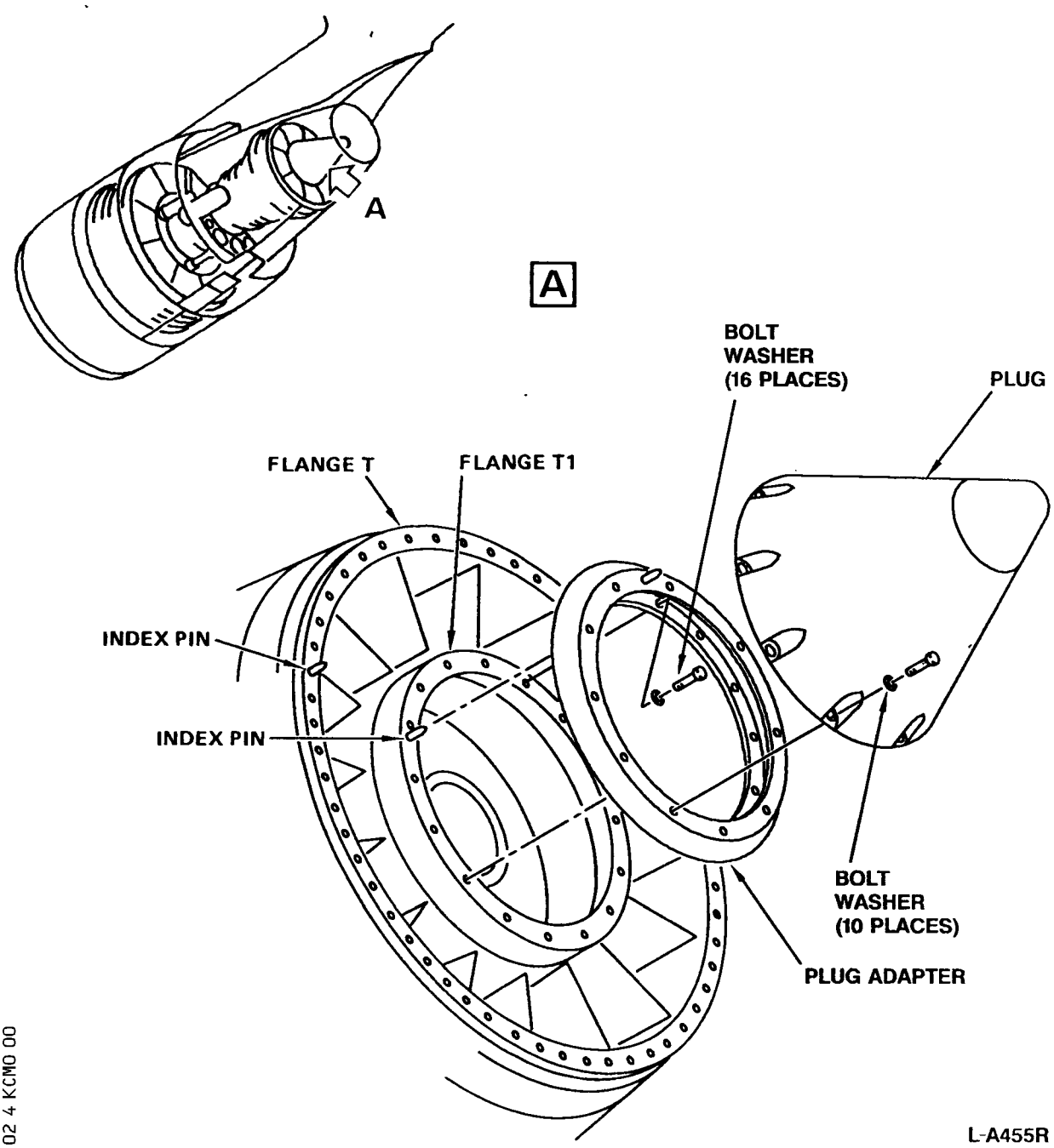
Engine Exhaust Plug Cone without Plug Adapter
Figure 401



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Engine Exhaust Plug Cone with Plug Adapter
Figure 402

ENGINE EXHAUST PLUG - INSPECTION CHECK

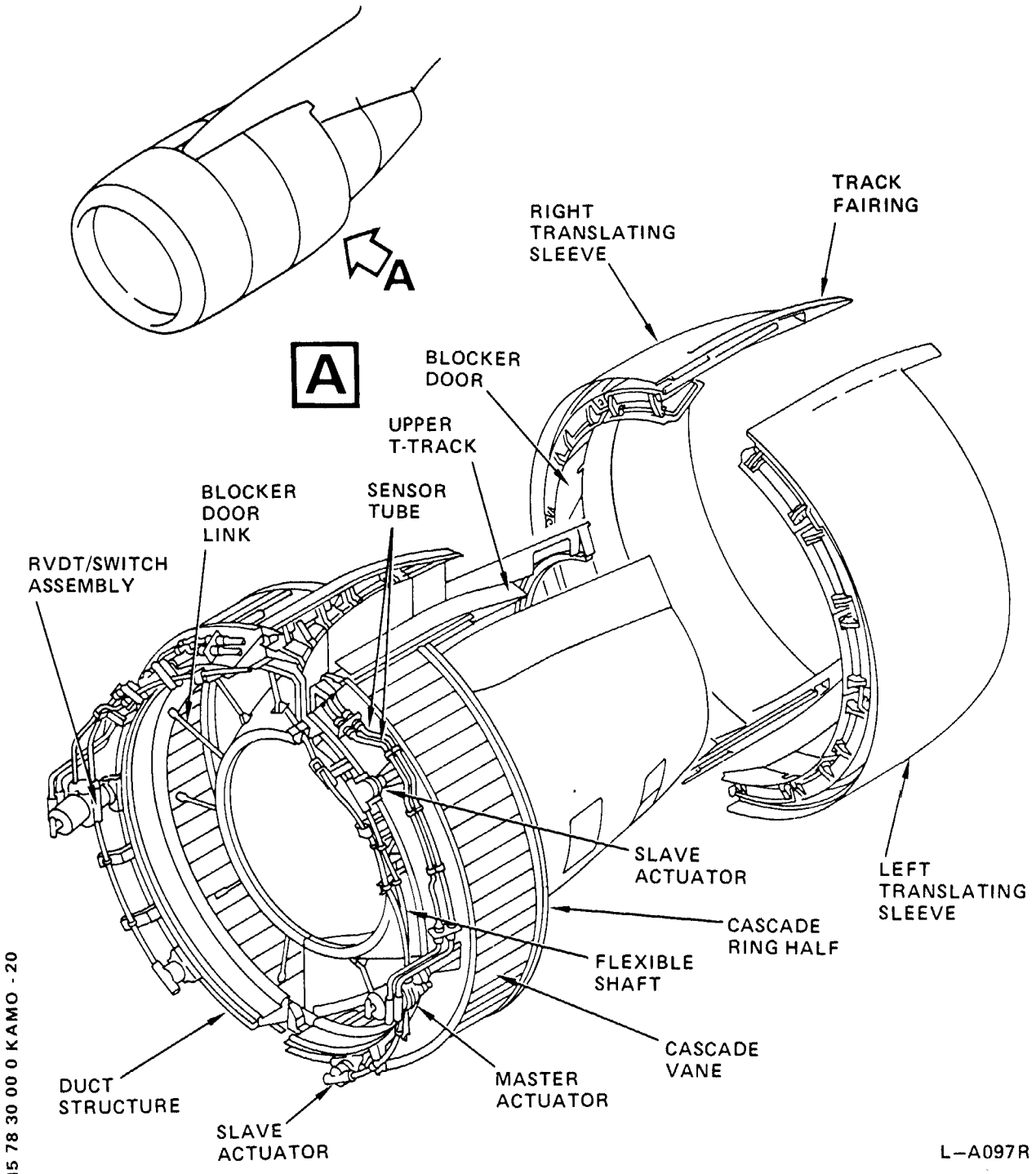
1. Inspect Engine Exhaust Plug

A. For Damage Limits (Ref. 71-00-00, P. Block 601).

THRUST REVERSER - DESCRIPTION AND OPERATION

1. General (Ref. Fig. 001)
The thrust reverser system is used to cancel the forward thrust and to provide an aerodynamic braking of the aircraft. The principle of the thrust reverser is to produce forward flow of the exhaust gases from the engine by a mechanical system. Only the fan air stream is reversed which has the advantage of using clean air at low temperature. The system is designed to be operated on the ground only.

2. Description (Ref. Fig. 001, 002, 003)
The fan reverser is a fixed cascade, translating sleeve, blocker door type. It is constructed in two halves that form kidney shaped bifurcated ducts. Each half is hinged from the pylon and latched together along the bottom splitline. Each duct half forms the fan inner and outer flow surfaces from the engine fan exit plane to the fan nozzle exit. Each half includes acoustically treated panels, cascades, blocker doors, translating sleeve, tracks and ball screw actuators.
When the reverser is deployed, the cascades direct the air stream in an outward and forward direction (Ref. Fig. 005, 006). This system is driven by a pneumatic motor using 15th stage compressor air.
The actuation system is designed to control the function of unlocking and deploying, holding deployed, stowing and locking of the fan thrust reverser sleeves through the arrangement of a pneumatic drive unit, flexible rotary shafts, ballscrew actuators with pneumatic/mechanical latches at master actuators in response to signals generated by the thrust reverser lever position on the throttle lever (Ref. Fig. 004). All ballscrew actuator motions are mechanically synchronized by interconnecting, flexible, rotary shafts.
(Post SB PW4NAC 78-80): A new thrust reverser design has been introduced into revenue service at Serial Number 0720001, and is designated by 1000 series part numbers for the thrust reverser halves. Though the improved thrust reverser is visually different than that of the previous design, this new thrust reverser maintains the same form, fit, and function which allows a thrust reverser half pre-Serial Number 0720001 to be installed with a post-Serial Number 0720001 thrust reverser half with no degradation to function and operation.
Visual differences include a one-piece inner barrel structure manufactured from bonded aluminum honeycomb.
The wire mesh acoustic treatment (pre-Serial Number 0720001) has been replaced with an improved perforated panel which maintains equivalent acoustic properties. The new thrust reverser is manufactured with a metallic heat blanket in the aft barrel area, compared to the previous sheet and frame construction.
Hinge attachment bolts, however, are specific to each design. That is, a thrust reverser pre-Serial Number 0720001 requires different hinge attachment bolts than a thrust reverser post-Serial Number 0720001.
NOTE : Operators are required to honor part number limitations relative to options (such as fire detection systems) and other non-interchangeable conditions. Refer to the respective Power Plant Illustrated Parts Catalogue.



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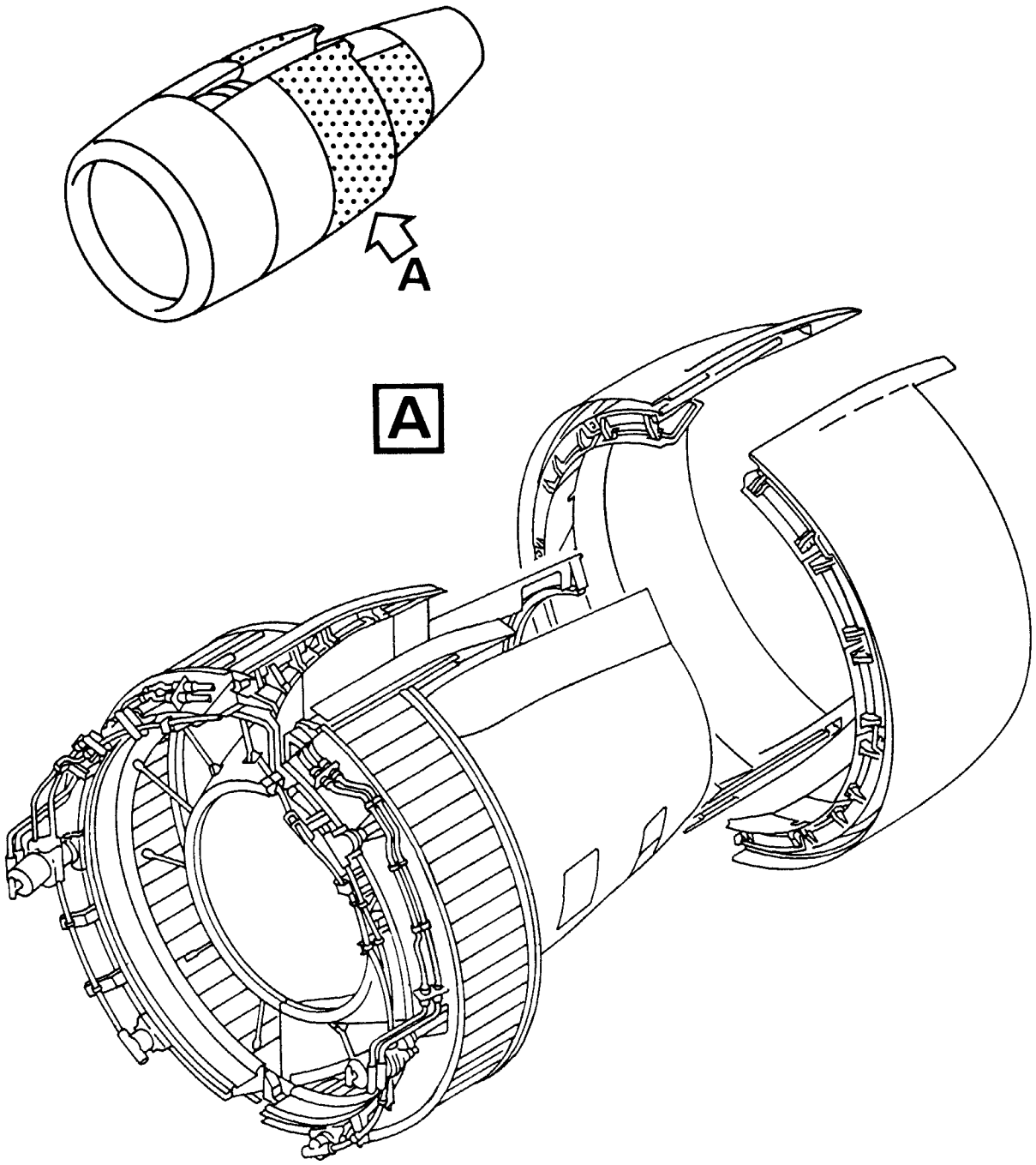
Thrust Reverser
Figure 001

Reverser operation and control systems remain unchanged.



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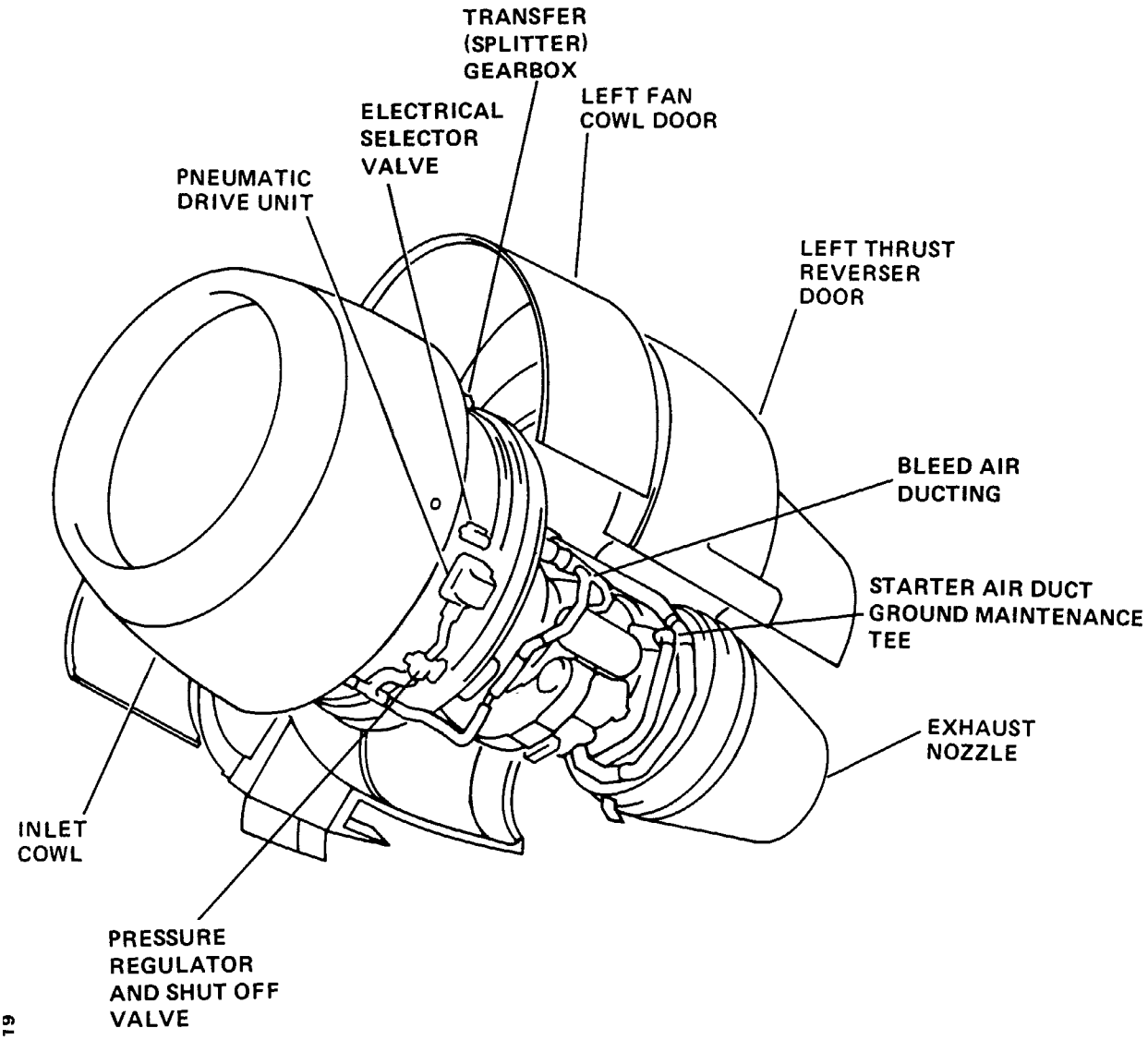
Thrust Reverser System
Figure 002



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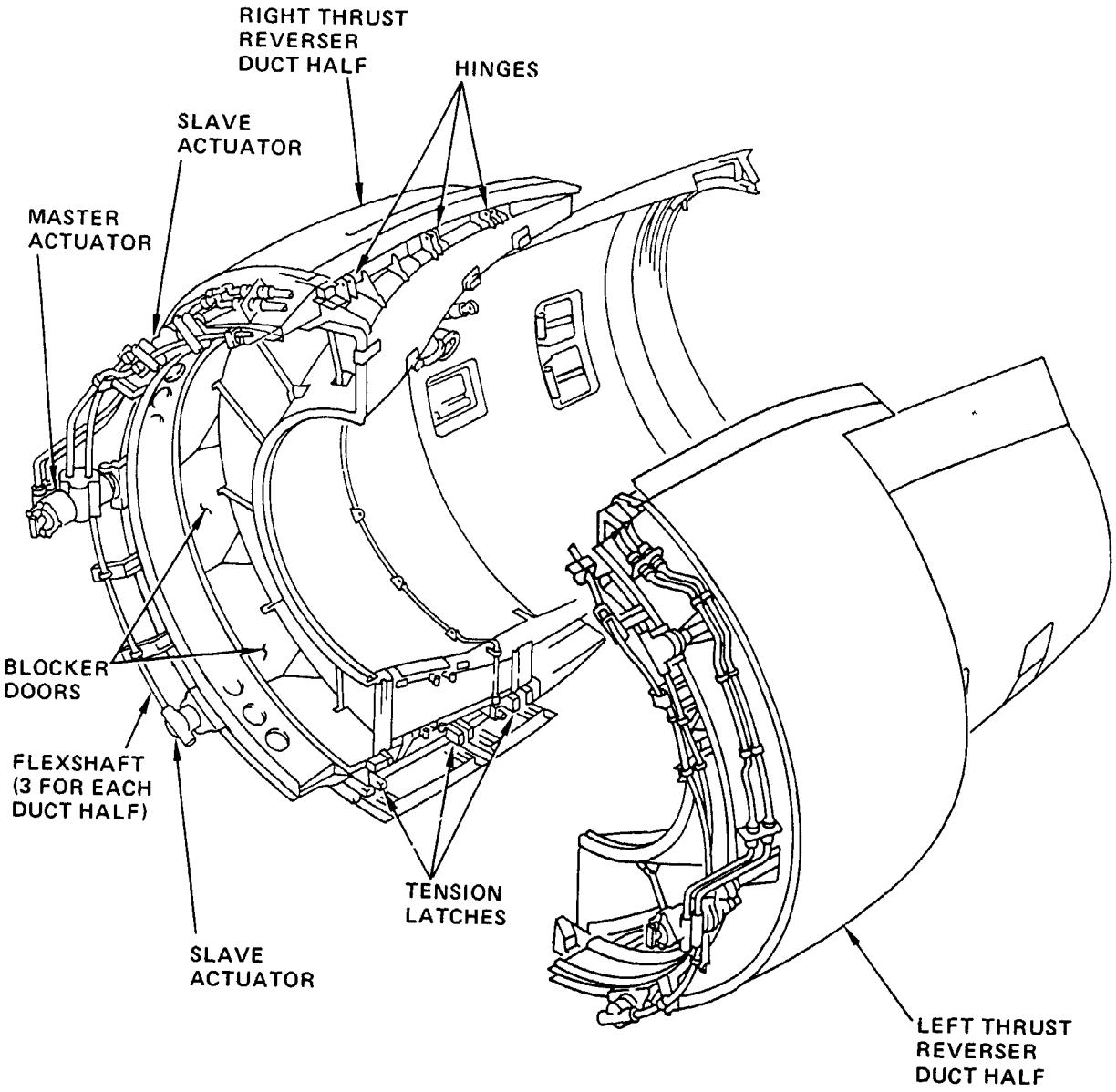
Engine Mounted Reverser Components
Figure 003



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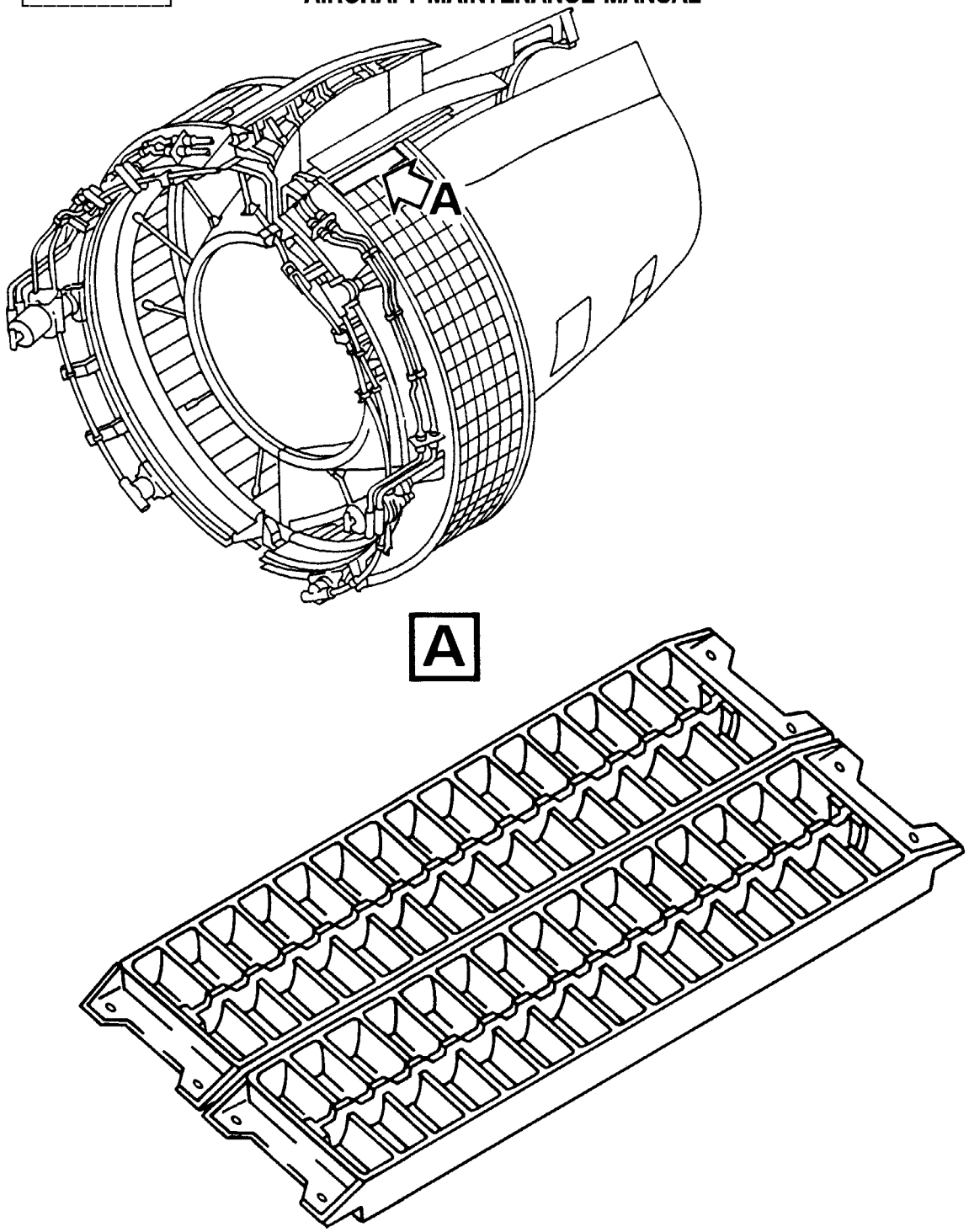
Reverser Components
Figure 004



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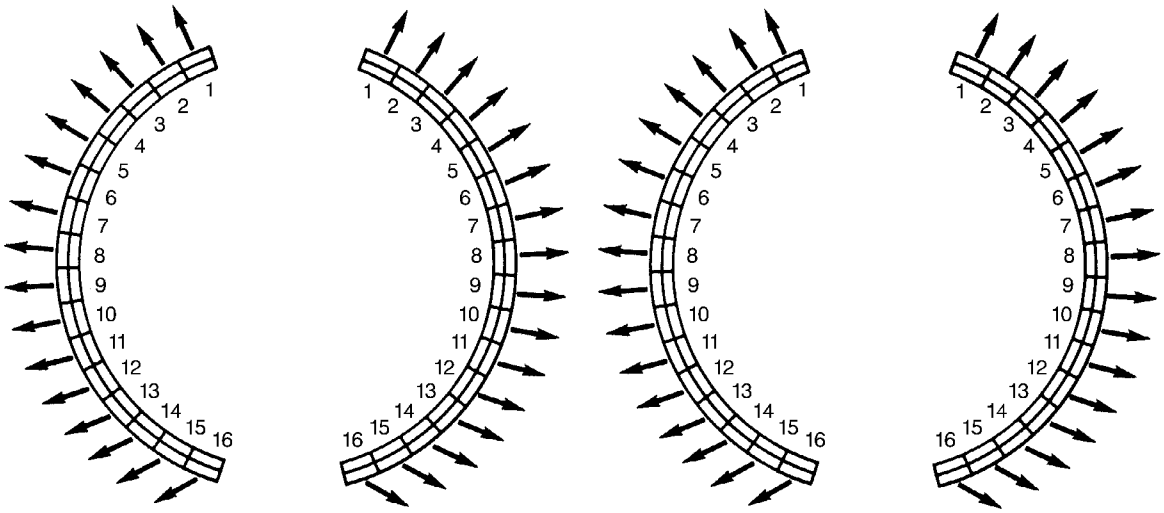
Thrust Reverser Cascades
Figure 005



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Cascade Configuration - Rear View
Figure 006

R

CAUTION : THIS PROCEDURE IS NOT APPROPRIATE FOLLOWING ENGINE CHANGE, EXHAUST NOZZLE CHANGE, OR THRUST REVERSER DOOR CHANGE. THOSE EVENTS REQUIRE COMPLETE THRUST REVERSER DOOR RIGGING IN ACCORDANCE WITH 71-13-03, P. BLOCK 501.

1. Periodic Check of Thrust Reverser Actuation System

A. General

This procedure provides a method to verify the thrust reverser actuation system is properly rigged and in working order. It will help to determine those components which need replacement and determine adjustments necessary to continue operation.

CAUTION : ANY COMPONENT FOUND NOT TO BE IN PROPER ADJUSTMENT SHOULD BE RE-RIGGED ACCORDING TO APPROPRIATE MAINTENANCE PRACTICE FOR THE THRUST REVERSER COMPONENT.

CAUTION : ANY COMPONENT NEEDING REPLACEMENT SHOULD BE REPLACED AND RIGGED ACCORDING TO THE REMOVAL/INSTALLATION PROCEDURE FOR THAT COMPONENT. SYSTEM RIGGING SHOULD BE VERIFIED AFTER COMPONENT REPLACEMENT. COMPONENT FAILURES MAY BE INDICATIVE OF RIGGING PROBLEMS ELSEWHERE IN THE SYSTEM.

B. Equipment and Materials

ITEM	DESIGNATION
(1)	Access Platform
(2)	Circuit Breaker Safety Clips
(3)	3/8 - In. Hex Drive Wrench Multimeter
(4)RSE1079	Hose, Ground Air Transfer
(5)Material No.P09-020	Sealants (Ref. 70-00-00)
(6)Material No.P11-002	Cleaning Agents (Ref. 70-00-00)
(7)Material No.P18-010	Primer (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
R - 73-38-00, P. Block 501	FADEC System Indicating
- 78-31-01, P. Block 401	Pneumatic Drive Unit
- 78-31-12, P. BLock 401	Fan Reverser Flexible Shaft Assy
- 78-31-15, P. Block 201	Master Slave Actuators
- 78-31-34, P. Block 401	Pneumatic Drive Unit Supply Ducts
- 78-31-36, P. Block 401	Thrust Reverser Sensor Tubes
- 78-31-37, P. Block 401	Thrust Reverser Pneumatic Hoses
- 78-31-40, P. Block 401	RVDT and Stow/Deploy Sw. Assy

C. Check

(Ref. Fig. 203, 201, 202)

(1)Job Set-Up

(a)Open, safety and tag the following circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).

(b)Install access platform.

(2)Check the following with the thrust reverser sleeve in full stow position (Ref. Fig. 202, 203).

NOTE : For location of the thrust reverser components. (Ref. Fig. 201)

(a)Measure the gap at Station 100 at each actuator between translating sleeve forward edge and thrust reverser frame aft surface to determine
R if the gap is within prescribed limits 0.09 and 0.21 in. (2.3 and
R 5.3 mm). Adjust gap if necessary (Ref. 78-31-15, P. Block 201).

(b)Flexible drive shaft cables.

1 Verify proper engagement. Check screws in the shaft end plates to be sure they are tight and lockwired. If adjustment is required (Ref. 78-31-12, P. Block 401).

2 Verify that cables are routed and clamped correctly (Ref. 78-31-12, P. Block 401).

3 Inspect cables for signs of overtension (birdcaging) or braid wear. Replace cables if required (Ref. 78-31-12, P. Block 401).

(c)Pneumatic Drive Unit (PDU)

1 Inspect unit for overheated condition. Verify that the temperature sensitive dots have not changed from gray to black.

a TWO-DOT TAPE : If inspecting a two-dot configured tape, one of the dots will turn black at 302 deg.F (150 deg.C).
The 302 deg.F (150 deg.C) is an indication of a normal operating range. When both dots turn black, the temperature has exceeded 480 deg.F (249 deg.C) and a PDU change is mandatory (Ref. 78-31-01, P. Block 401).

b ONE-DOT TAPE : If a one-dot configured tape has turned black, the temperature has exceeded 480 deg.F (249 deg.C), and a PDU change is mandatory (Ref. 78-31-01, P. Block 401).

c If there are no signs of actual overheating and no reported problems (in-bound maintenance log items), replace the exposed indicating label, within 10 days (Deactivation of the thrust reverser is not required provided there is no heat damage to the PDU, and there is no other thrust reverser faults reported) as follows :
Clean the housing area where the label will be installed on the drive unit with Material No.P11-002 or equivalent. Peel the adhesive backing from the label and install the label so that it can be read when viewed from the feedback mechanism to the brake assembly. Apply a thin bead of Material No.P18-010 or equivalent approximately 0.125 in. (3.2 mm) wide to all edges. Allow to dry a minimum of ten minutes.
Apply a thin bead of Material No.P09-020 or equivalent approximately 0.125 in. (3.2 mm) wide to all edges. Allow to air cure a minimum of 24 hours in an atmosphere of 30 percent or greater relative humidity before packing for storage.
Enter a maintenance item to recheck the label when the fan cowl is opened for any reason.

2 Check the PDU brake indication switch.
Disconnect the connector DS304 from PDU. Connect the multimeter or test lamp between pins A and B of the PDU. There should be no continuity. Pull the brake handle. With the handle extended there should be continuity between pins A and B. Release the brake handle.

It should retract and continuity between pins A and B should open. Reconnect connector to PDU.

3 Check the PDU brake integrity. This test is done with all the brakes and locks retracted. Apply 80 lb-in. (9.0 N.m) to the left hand master actuator hex drive in the direction to deploy the reverser. The reverser should not deploy under this load.

(d)Pneumatic ducts and signal lines

1 Check that PDU supply duct connections are secure and there are no signs of leakage. Replace as required (Ref. 78-31-34, P. block 401).

2 Flexible hoses between pylon, thrust reverser doors and fan case are in good condition. Replace as required. (Ref. 78-31-36, P. Block 401) for sensor lines and 78-31-37 for pneumatic hoses.

WARNING : DISCONNECT THE AIR SUPPLY FROM THRUST REVERSER DURING THE FOLLOWING CHECKS. FAILURE TO DO SO COULD RESULT IN SUDDEN REVERSER MOVEMENTS WITH POSSIBLE INJURY TO PERSONNEL.

(e)Verify RVDT and Stow/Deploy Switch indicators. Check limit switch shaft indicator, stow switch cam indicator and RVDT shaft mark are correctly aligned (Ref. Fig. 202). If alignment is required (Ref. 78-31-40, P. Block 401.)

(f)Block open the PDU brake handle and secondary lock handles. Manually deploy and stow sleeves and verify ease of operation (check torque). At three positions along the stroke, approximately 1, 10, and 20 inches (2.54, 25.4, and 50.8 mm), check at the master actuator that maximum torque required to drive the sleeve in either direction does not exceed 25 lb-in. (2.8 N.m).

(g)Verify master actuator secondary lock and stow switch operation.

1 Block open PDU brake handle. Do not block open secondary lock handle.

2 Put 3/8-in drive into master actuator hex (both sides) and hold on "stow".

3 Verify the actuator pointers are at the 'delta' as shown (Ref. Fig. 201), if the pointer is not in the correct position, resynchronize the master actuator secondary locks (Ref. 78-31-15, P. Block 201).

4 Block open the RH master actuator secondary lock handle. Do not block open the LH secondary lock handle. Slowly deploy the LH master actuator by hand. After each full revolution (turn) check to see if master actuator handle will pull out. Force to pull the handle should be about 20 pounds (89 N). After two turns, the handle should pull out. After three turns the handle should not.

5 Continue deploying master actuator by hand and counting turns. After nine to ten (9 to 10) turns the secondary lock should prevent further deployment.

NOTE : If RVDT switch fails in either of the following steps, replace the switch (Ref. 78-31-40, P. Block 401).

6 Connect a multimeter or test lamp to pins 3 and 4 and between pins 5 and 6 of RVDT switch DS301 (DS307). There should be continuity.

7 Slowly stow the reverser. When multimeter indicates an open circuit between pins 3 and 4, count turns until full stow. Full stow should be 3 1/2 to 6 turns. Slowly deploy the reverser until there is continuity

between pins 5 and 6. Slowly stow the reverser. When the multimeter indicates an open circuit between pins 5 and 6, count turns until full stow. Full stow should be 3 1/2 to 6 turns.

8 Remove the block from the RH master actuator. Block open the LH master actuator. Slowly deploy the RH master actuator by hand, repeating Sreps (4) through (7).

9 Remove the blocks from the LH master actuator secondary lock and PDU and put manual unlock levers of synchronous shaft locks in normal position.

(h)Verify the operation of the LH master actuator secondary lock switch.

1 Disconnect the connector to the master actuator and connect a multimeter to pins A and B.
There should be no continuity.

2 Pull the handle of the master actuator. There should be continuity between pins A and B.

3 Release the handle of the master actuator. The handle should retract and there should be no continuity between pins A and B.

4 Replace the connector. Repeat the check on the RH master actuator.

R (j)Perform periodic servicing.

R

R (k)Pneumatically cycle the reverser to deploy and stow and verify the following :

1 Cockpit indicator lights operating correctly (Ref. 78-31-00, P. Block 501).

2 Reverser deploys within 2.5 seconds and stows within 5.0 seconds.

3 Station 100 gap is adjusted correctly Ref. step 3.B.(1).

4 Master actuator secondary lock indicator is operational. (Ref. Fig. 202)

5 Do a FADEC Ground Test (Ref. 73-38-00, P. Block 501). Check on right ECAM page that REV% is between -2 and 2 percent.

(3)Close-Up

(a)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(b)Remove access platform.

(c)Close fan cowl doors (Ref. 71-13-00, P. Block 301).

(d)Remove safety clips and tags and close circuit breakers for appropriate engine.

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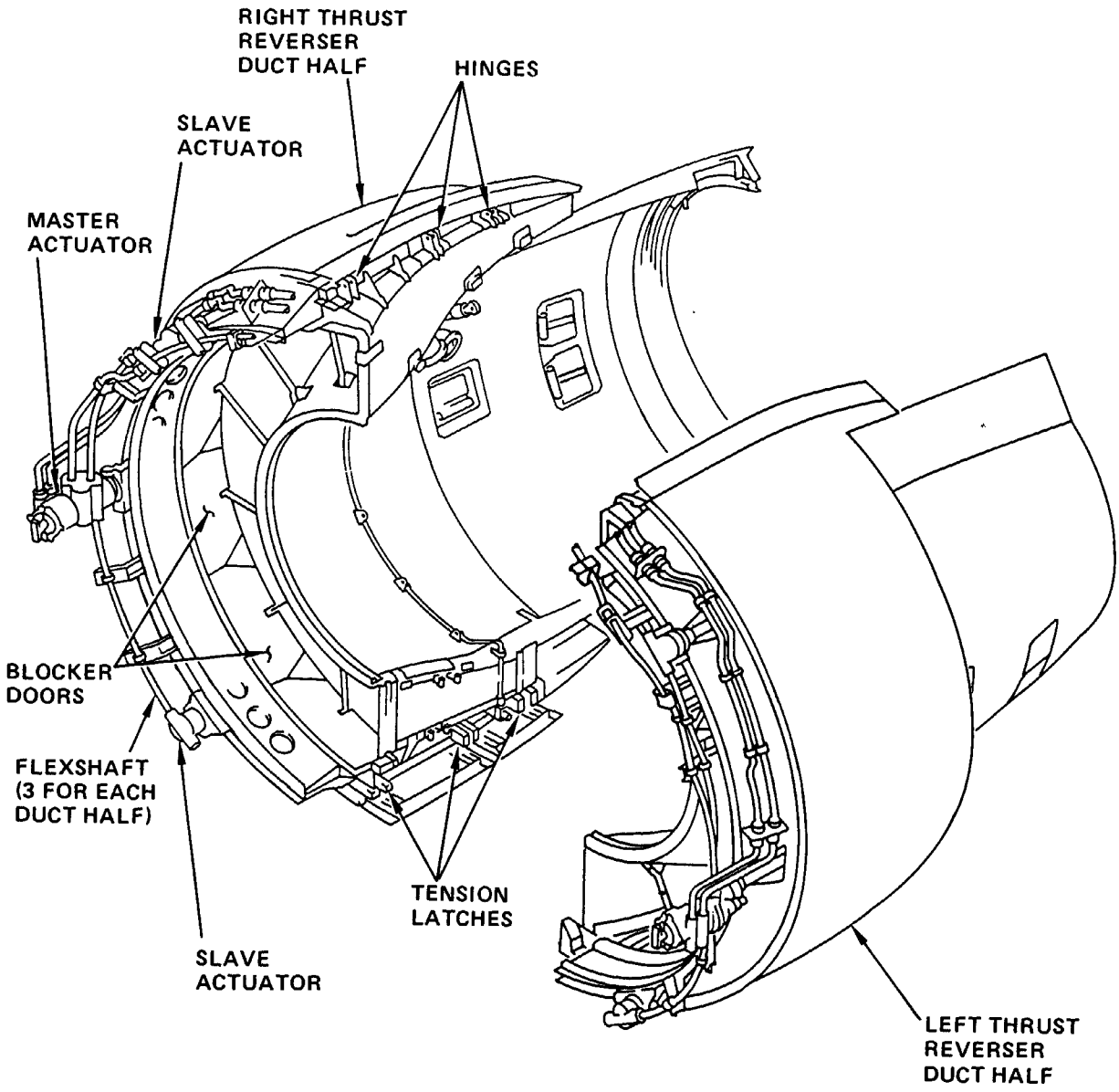
2. Check Synchronous Shaft Lock System Integrity

NOTE : The following procedure applies to both L/H and R/H thrust reverser synchronous shaft lock assemblies.

A. General

(1)This procedure provides a method to verify that the synchronous shaft



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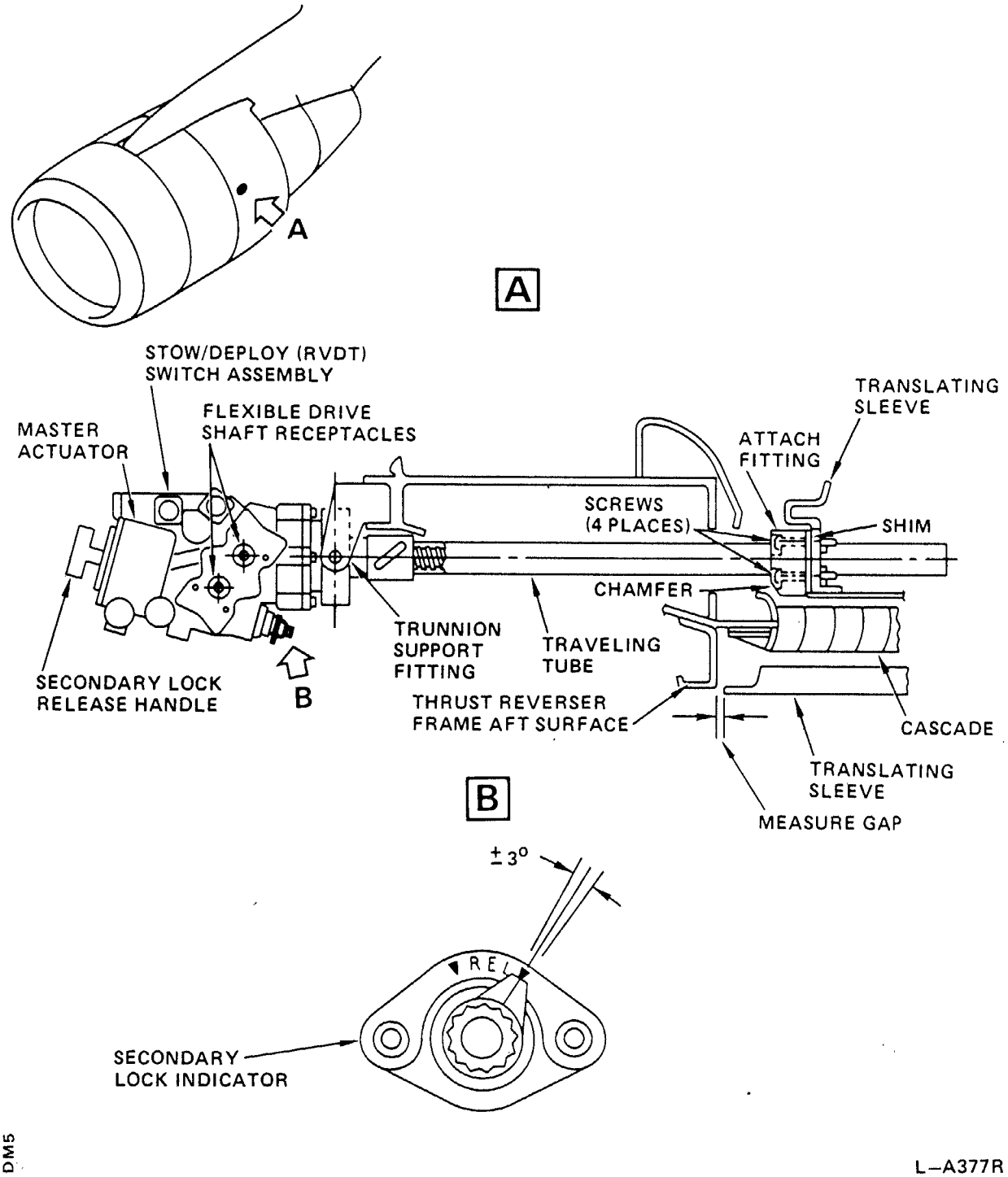
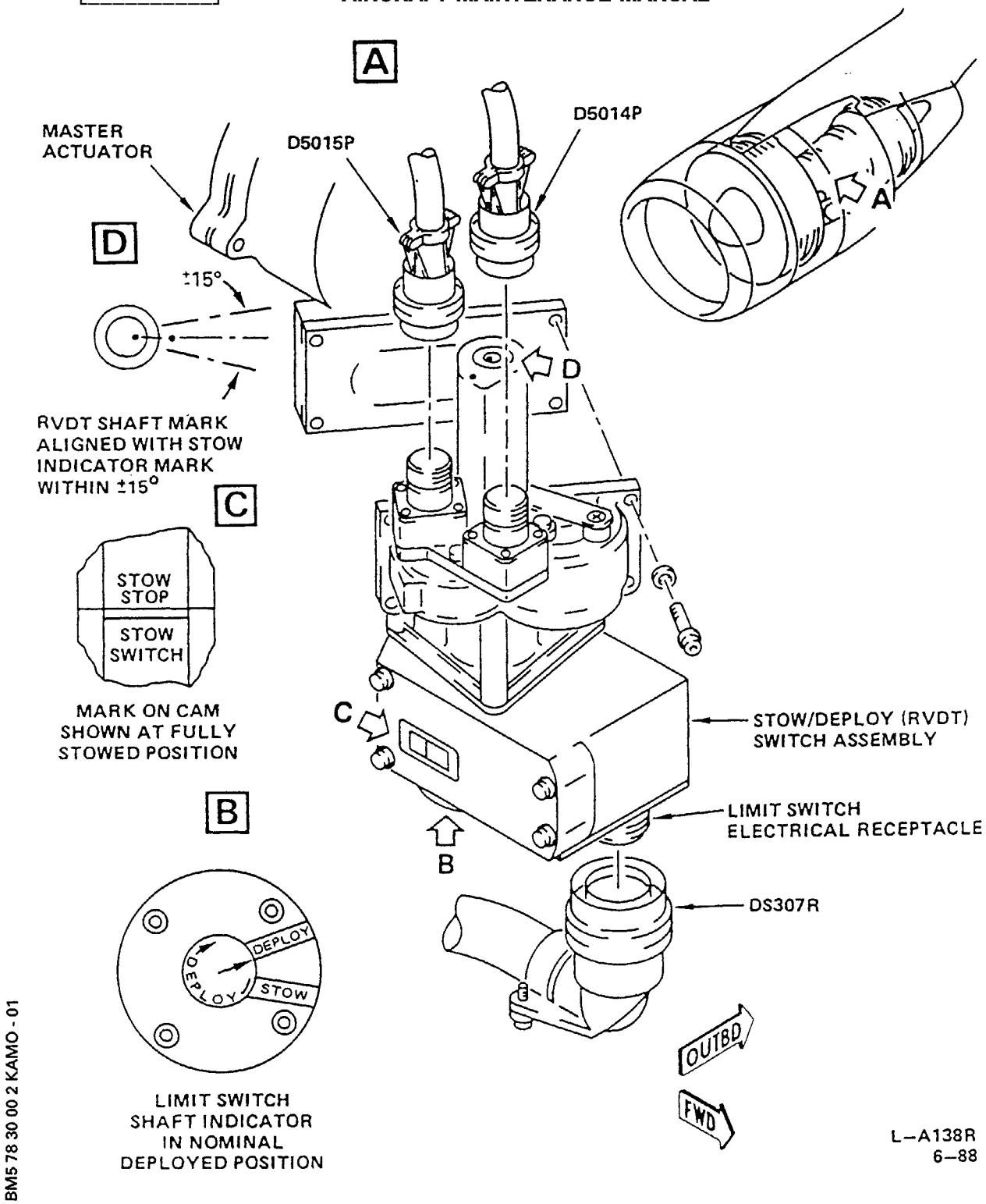
Thrust Reverser Components
Figure 201



Actuator in Full Stow Position
Figure 202



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RVDT and Stow/Deploy Switch Assembly
Figure 203

lock assembly is functioning properly.

B. Equipment and Materials

ITEM	DESIGNATION
(1)	Access Platform
(2)	Circuit Breaker Safety Clips
(3)	3/8 - In. Hex Drive Wrench Multimeter
Referenced Procedure - 71-13-00, P. Block 301	Cowl Doors

C. Procedure

(1)Job Set-Up

(a)Open safety and tag the following circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).

(2)Check

(a)Verify that the thrust reverser control levers (in the flight compartment) are at the forward idle position.

CAUTION : MAKE SURE THAT THE SYNCHRONOUS SHAFT LOCK SOLENOIDS ARE NOT ELECTRICALLY POWERED TO THE UNLOCK POSITION.

CAUTION : DISCONNECT THE AIR POWER SUPPLY BEFORE PERFORMING INTEGRITY CHECK OF THE SYNCHRONOUS SHAFT LOCK MECHANISM. DO NOT ATTEMPT TO MANUALLY MOVE THE SLEEVES WHEN AN AIR SUPPLY IS CONNECTED TO THE PNEUMATIC DRIVE UNIT (PDU). A POWER SURGE COULD CAUSE SERIOUS INJURY TO PERSONNEL AND DAMAGE EQUIPMENT.

(b)Unlock the PDU brake and restrain (Ref. Fig. 204).

(c)Unlock and restrain in the unlocked position both master actuator secondary locks (Ref. Fig. 205).

(d)Unlock the RH synchronous shaft lock using the manual lever (Ref. Fig. 206).

(e)Visually verify that the LH synchronous shaft lock is in the locked position (manual unlock lever position). Insert a hex drive tool in the LH unused master actuator drive port and attempt to deploy the thrust reverser while turning counterclockwise.

NOTE : Input TORQUE shall be no greater than 300 lbf.in (3.39 m.daN). Do not ecxceed this torque and apply only one time during this check. Input drive tool handle shall not rotate more than 119.5 degrees total (62.5 degrees of travel with approximately 25 lbf.in (0.28 m.daN) load and not more than 57 degrees of travel with 300 lbf.in (3.39 m.daN) load).

NOTE : Input drive tool handle may rotate as much as 119.5 degrees in order for synchronous shaft lock rotor to engage internal lock pins and for torsional deflection of flex shaft.

(f)Relock the RH synchronous shaft lock and unlock the LH synchronous.

(g)Insert a hex drive tool in the RH unused master actuator drive port and attempt to deploy the reverser while turning clockwise. Input TORQUE shall be 300 lbf.in (3.39 m.daN) (do not exceed this value and apply one time only during this check). Input drive tool handle shall not rotate more than 119.5 degrees.

NOTE : Input drive tool handle may rotate as much as 119.5 degrees

in order for synchronous shaft lock rotor to engage internal lock pins and for torsional deflection of flex shaft.

R (h)The following is the pre-flight procedure to properly relock the thrust
R reverser.

1 Ensure that both RH and LH synchronous shaft locks are UNLOCKED.

2 While holding the master actuator on its stop by torque input in the unused master actuator drive port, return the PDU brake handle to the locked (brake engaged) position (this requires at least 2 people).

3 Release both master actuator lock handles.

4 Move both synchronous shaft lock manual levers to the LOCKED position.

NOTE : Failure to follow this procedure could result in the thrust reverser not being fully stowed on its first flight after this check and possibly will cause an unlock light. The thrust reverser can be pneumatically cycled after this check to ensure a full stow condition of the translating sleeve.

(3)Close-Up

(a)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(b)Remove access platform.

(c)Close fan cowl doors (Ref. 71-13-00, P. Block 301).

(d)Remove safety clips and tags and close following circuit breakers for appropriate engine.

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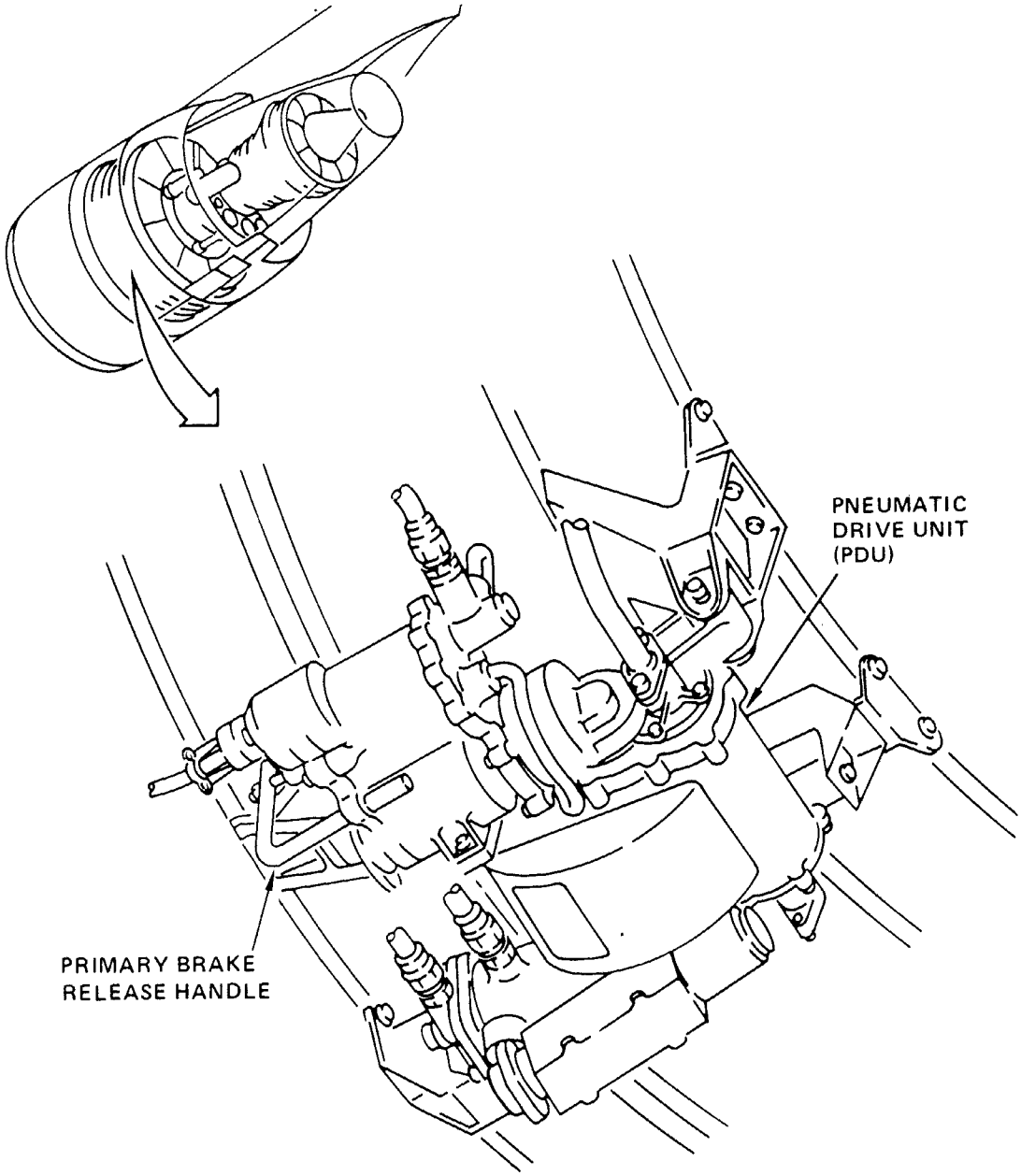

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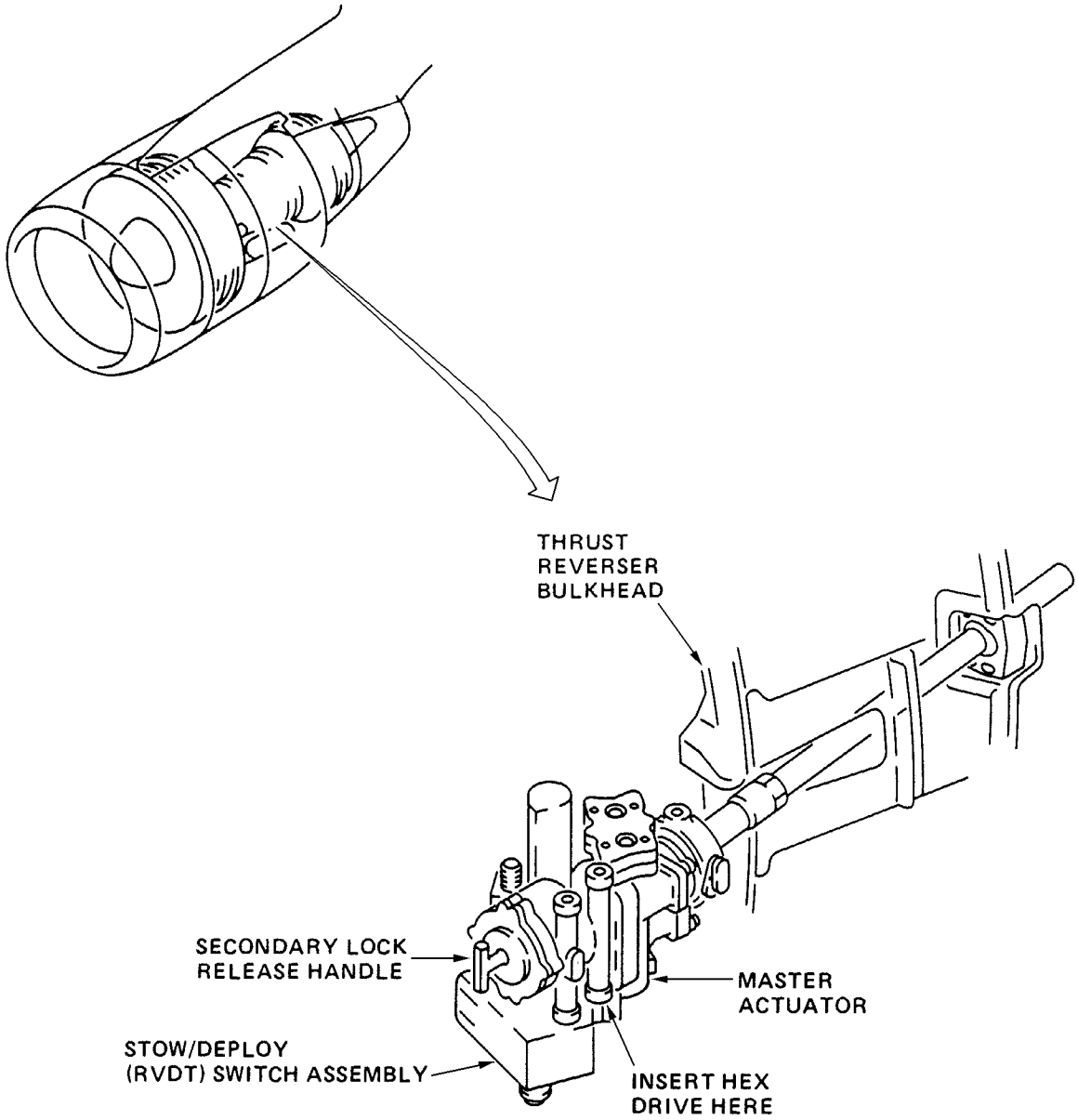
Primary Brake Release Handle
Figure 204



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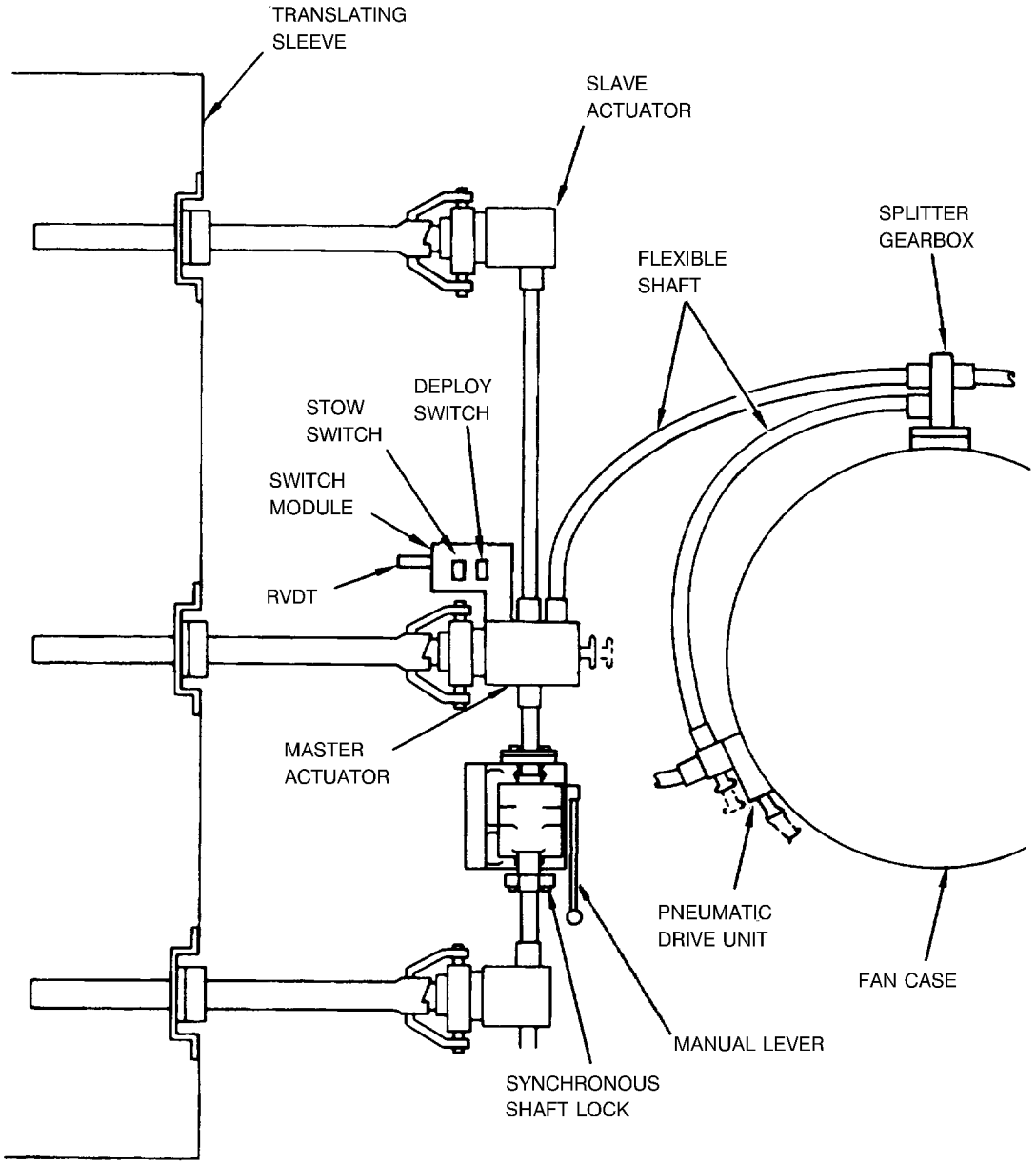
Secondary Lock Release Handle
Figure 205



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Thrust Reverser Synchronous Lock
Assembly Integrity Check
Figure 206

1. Cleaning Requirements After Chemical Contact with Hydraulic Fluid

A. General

This procedure gives direction on how to clean the engine after chemical contact with hydraulic fluid.

B. Equipment and Materials

ITEM	DESIGNATION
Referenced Procedure - 70-00-00, P. Block 201	Engine - Standard Practices

C. Procedure

(1) If necessary, clean the engine to remove hydraulic fluid by SPOP 425 (Ref. 70-00-00, P. Block 201).

THRUST REVERSER SYSTEM CONTROL - DESCRIPTION AND OPERATION

1. Thrust Reverser System Controls

A. General

The thrust reverser is controlled by a separate lever installed on the engine throttle control lever (Ref. Fig. 001). The following particular safety features are provided :

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- To avoid inadvertent thrust reverser deployment when in forward thrust, the mechanical design of the throttle control lever prevents actuation of the thrust reverser lever to the deploy position when the throttle control lever is not in idle position.
- To facilite reverse operation, a mechanical friction point is introduced in the reverse control lever mechanism. This indicates to the crew that the idle threshold is reached. This threshold must be overriden to increase reverse thrust by moving the thrust reverser lever.

2. Component Location

(Ref. Fig. 002, 003, 004)

FIN	FUNCTIONAL DESIGNATION	PANEL	ZONE	ACCESS DOOR	ATA REF.
S304	DRIVE UNIT - PNEUMATIC		435	435AL	78-31-01
			445	445AL	
H9	VALVE - PRESSURE REGULATING		436	436AR	78-31-05
	AND SHUT OFF		446	446AR	
H15	VALVE SELECTOR, SOLENOID OPERATED		435	435AL	78-31-10
			445	445AL	
	ACTUATOR - MASTER AND SLAVE		453	451AL	78-31-15
			463	461AL	
S301	STOW/DEPLOY RVDT SWITCHES (RH)		453	451AL	78-31-40
			463	461AL	
S307	STOW/DEPLOY RVDT SWITCHES (LH)		454	452AR	78-31-40
			464	462AR	
	CRANK ARM - FEEDBACK		453	451AL	78-31-21
			463	461AL	
	PNEUMATIC VALVE - GROUND		436	436AR	78-31-33
	OPERATING AIR TRANSFER		446	446AR	
	DUCTS - SUPPLY, PDU		435	435AL	78-31-34
			445	445AL	
	GEARBOX - SPLITTER		435	435AL	78-31-35
			445	445AL	
	PNEUMATIC HOSE - THRUST		435	435AL	78-31-57
	REVERSER		445	445AL	
	FLEXIBLE SHAFT ASSEMBLIES		453	451AL	78-31-12

FIN	FUNCTIONAL DESIGNATION	PANEL	ZONE	ACCESS DOOR	ATA REF.
	THRUST REVERSER		463	461AL	
			435	435AL	
			445	445AL	
	SENSOR TUBES - THRUST REVERSER		453	451AL	78-31-36
			463	461AL	
H16	LOCK - SYNCHRONOUS SHAFT (RH)		453	451AL	
H17	LOCK - SYNCHRONOUS SHAFT (LH)		463	461AL	

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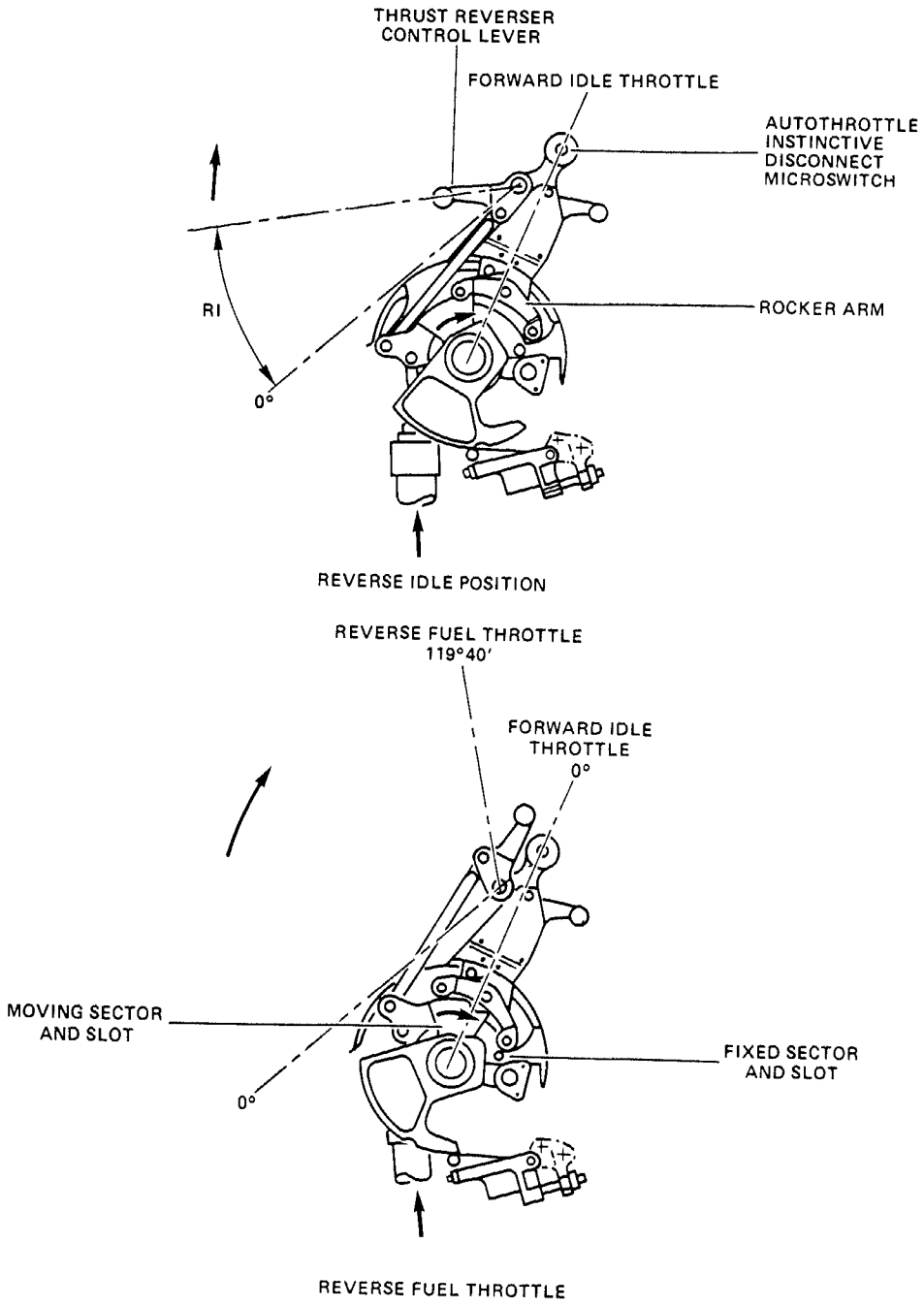
3. Thrust Reverser Actuation System Operation

A. General (Ref. Fig. 005, 006, 007)
(Ref. Fig. 008, 009)
These figures show the detailed scheme of the pneumatic actuation. The system is electrically controlled as described in paragraph E.

B. Operation (Ref. Fig. 001, 005)
- To deploy
To deploy the system, the throttle control lever is moved to idle and reverser control lever is rotated up. An electrical deploy command is then applied to the latching deploy solenoid valve simultaneously with an electrical signal to relay 46KM (47KM), which supplies both synchronous shaft lock solenoids and relay 48KM (49KM) coil. After 250 ms, relay 48KM (49KM) closes and an electrical signal is sent to the arming solenoid valve which supplies air to the control switcher, shifting it to the open position.
Inlet air flows through the manual deactivation valve, the open control switcher, and the reference regulator of the lock actuator of RH master actuator. The safety relief valve provides downstream component protection in the event of a failure of the reference regulator.
If the ballscrew is positioned within 1/8'' of the fully stowed position, the lock cam permits the lock actuator to stroke. This ports air to the lock actuator of LH master actuator which executes a similar sequence, supplying air to the arming port of the pressure regulator and shutoff valve. The orifice check valve opens and air flows into the opening chamber of the valve actuator. As the butterfly opens, the sensing port directs regulated pressure to the feedback chamber of the valve actuator. The resulting equilibrium regulates the supply air pressure to the pneumatic drive unit.
Regulated air flows through the latching deploy solenoid valve and shifts the electrical selector valve to the deploy position. This ports air to the deploy port of the pneumatic drive unit and shifts the directional



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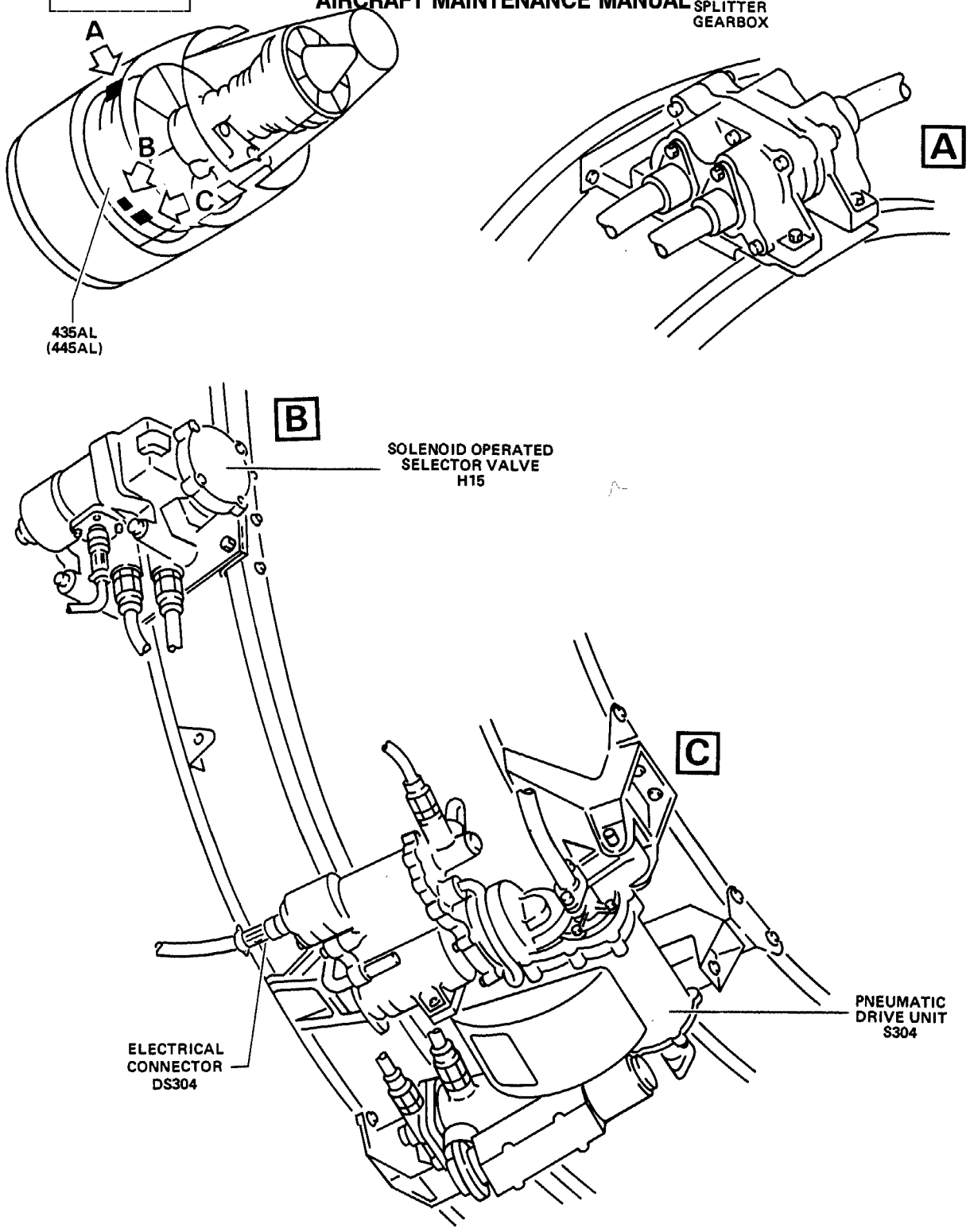
Throttle Control Handle Thrust Reverser
Figure 001



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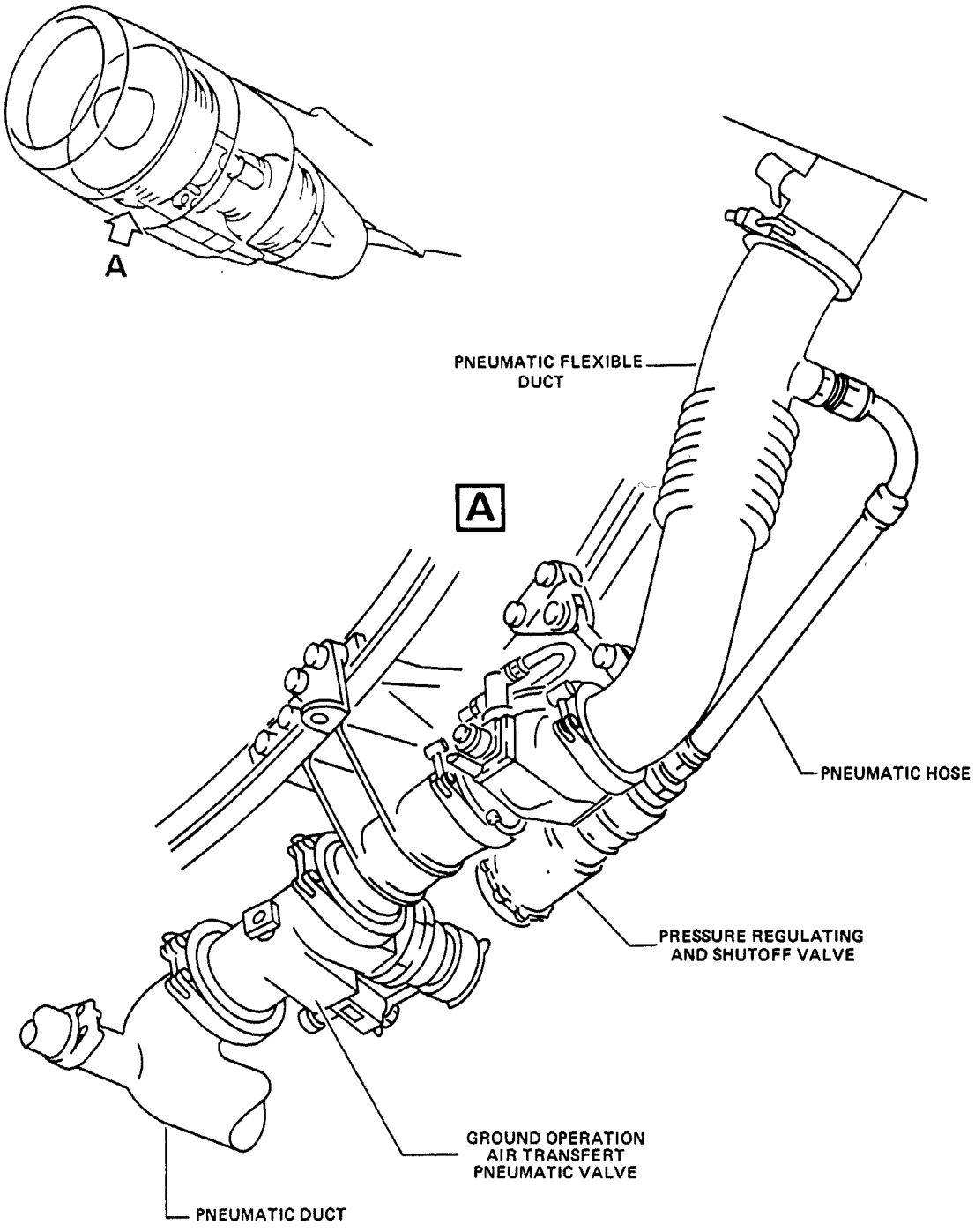
Thrust Reverser System - Component Location
Figure 002



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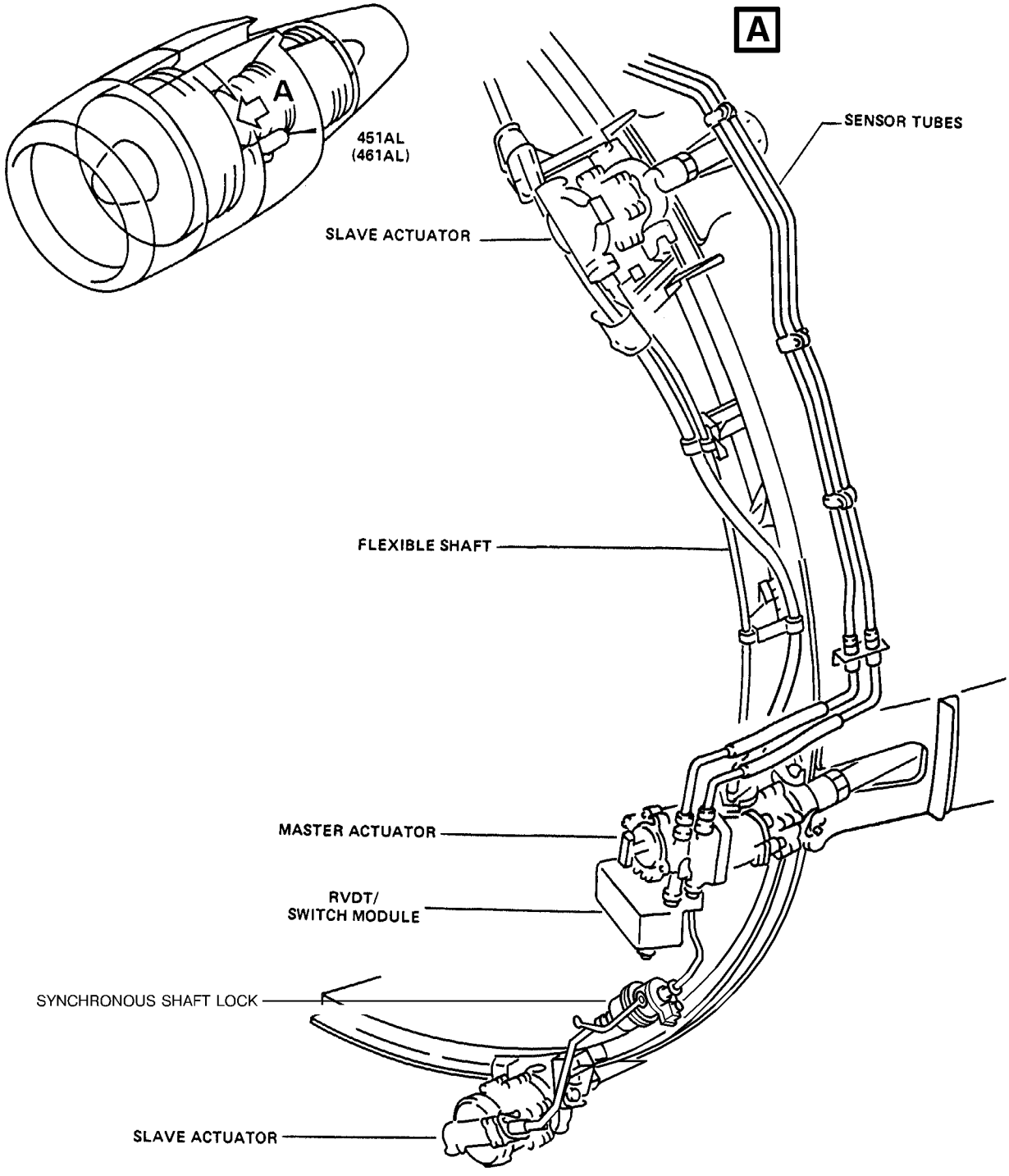
Thrust Reverser System - Component Location
Figure 003



Thrust Reverser System - Component Location
Figure 004

valve actuator to the deploy mode. This strokes the feedback cam to the right of both the stow and deploy dump valves. With both dump valves seated, the brake dump valve seats and regulated air flows into the brake actuator and the brake releases. The directional valve, which had been rotated to the wide-open deploy position by the directional valve actuator, directs air to the air motor to accelerate it in the deploy direction of rotation.

The system of flexshafts released by the synchronous shaft locks, gearboxes, and ballscrews translates the thrust reverser sleeve toward the deploy position. The feedback screw in the pneumatic drive unit rotates in relation to the air motor and translates the feedback nut until it contacts the feedback mechanism and strokes it to the null position.

This progressively closes the directional valve, which causes the air motor to decelerate, and also strokes the feedback cam into contact with the deploy dump valve poppet which is stroked and vents the brake dump valve, which opens and rapidly vents the brake actuator.

This applies the brake, which completes deceleration of the system to an accurate stop in the deploy position. The feedback modules, located on the master actuators, provide electrical position inputs to the airframe which indicate that both sleeves of the reverser are deployed and ready for application of reverse power. The feedback module also includes a deploy limit switch to provide flight compartment indication that the reverser is in the deploy position.

- To stow (Ref. Fig. 006)

To stow the system, the reverser control lever is rotated down into the forward thrust position. An electrical stow command is then applied to the latching deploy solenoid valve which directs regulated air to shift the electrical selector valve to the stow position. Regulated air is directed to the stow port of the pneumatic drive unit and shifts the directional valve actuator to the stow mode. This strokes the feedback cam to the left of the stow and deploy dump valves and allows them to seat. The brake dump valve seats and air pressurizes the brake actuator which strokes to release the brake.

The directional valve, which had been rotated to the wide-open stow position by the directional valve actuator, admits air to the air motor to accelerate it in the stow direction of rotation to translate the system toward stow. When the feedback nut contacts the feedback mechanism, it strokes it toward the null position, which progressively closes the directional valve. The air motor decelerates and slows the system until stow contact is made.

Electrical power is removed from the arming solenoid valve, which closes and vents the control switcher. RH, and then the LH, lock actuator return to the at-rest position, venting the arming port of the pressure regulator and shutoff valve. The orifice check valve seats, providing a slow closure of the valve and a resultant slow decay of the regulated pressure. A slot included in the contour of the directional valve causes the air motor to develop a residual stall torque in the stow direction when the directional valve is in the stow null position.

This allows the pneumatic drive unit to apply a residual stowing torque to the flexshafts to assure stow stop contact. As the inlet pressure

slowly decays, the brake dump valve rapidly vents the brake actuator, which applies the brake before the motor inlet pressure is removed, locking this residual torque into the flexshafts.
The feedback module stow switches provide cockpit indication that the reverser is fully stowed and remove the electrical power from the arming solenoid. The feedback module also provides a dual proportional electrical feedback signal to the electronic engine controller from an integral RVDT unit. Ten seconds after a stow command, the synchronous shaft lock solenoids are de-energized (opening of relay 46KM (47KM)), the armature is released and the pins re-engage, which prevents triangular rotor plate from rotating. Additional features of the actuation system include the following.
Electrical switches indicate unlock of the lock actuators in the master actuators, and also brake release in the pneumatic drive unit. The stow dump valve is positioned so that it is not contacted during a normal stow cycle with the pneumatic drive unit rigged into the system. However, it is provided for use during bench calibration of the pneumatic drive when an accurate stop is required in the stow position to provide a repeatable basis for the rev count.
The manual deactivation valve serves to de-activate the system by both manually closing the butterfly in the pressure regulator and shutoff valve and removing the source of control air upstream of the control switcher.

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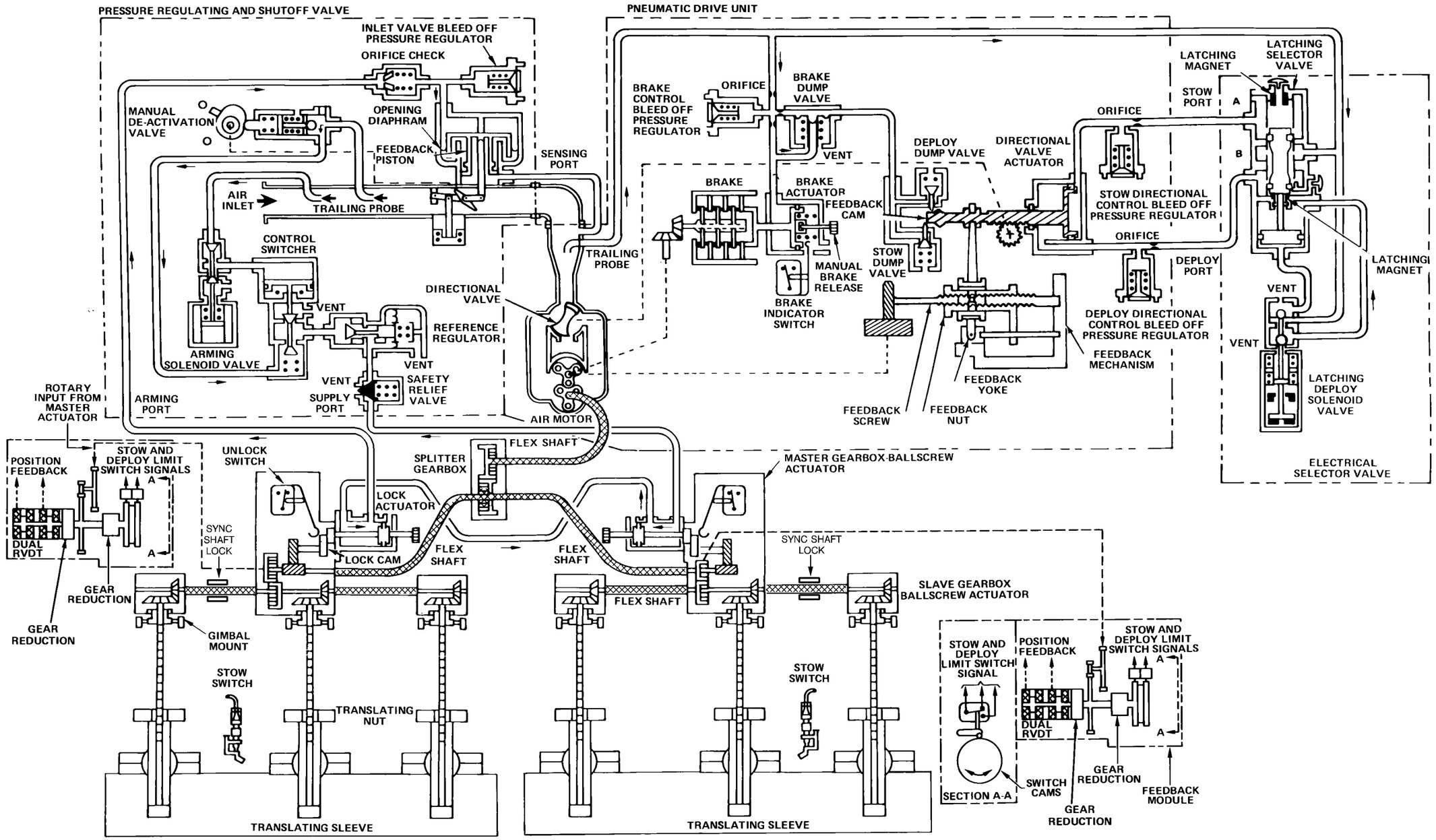
C. Safety Features
If for any reason a thrust reverser sleeve leaves the stowed position in flight, the sleeve stow switch will close. In this condition, both synchronous shaft locks keep thrust reverser in stow position. In addition the arming solenoid and stow solenoid will be energized resulting in automatic actuation to the stowed position.
In flight malfunction of the thrust reverser system will only occur due to equipment failure or to reception of an improper deploy signal supplying synchronous shaft locks and selector valve deploy solenoid and removing power supply from selector valve stow solenoid in conjunction with an arming signal.
Equipment Failure
In the event of an air motor, splitter gearbox, master actuator, or main flexshaft failure, the transcowl driftback is precluded by engagement (inside synchronous shaft lock) of triangular rotor plate with either of the two pins. This prevents master actuator input shaft and ball screw from rotating and sleeve from deploying.
NOTE : Each synchronous shaft lock is capable on its own of retaining both sleeves in the fully stowed position against deployment loads.
In case of synchronous shaft lock failure, to lock the secondary locking feature built into the master actuators is designed to limit



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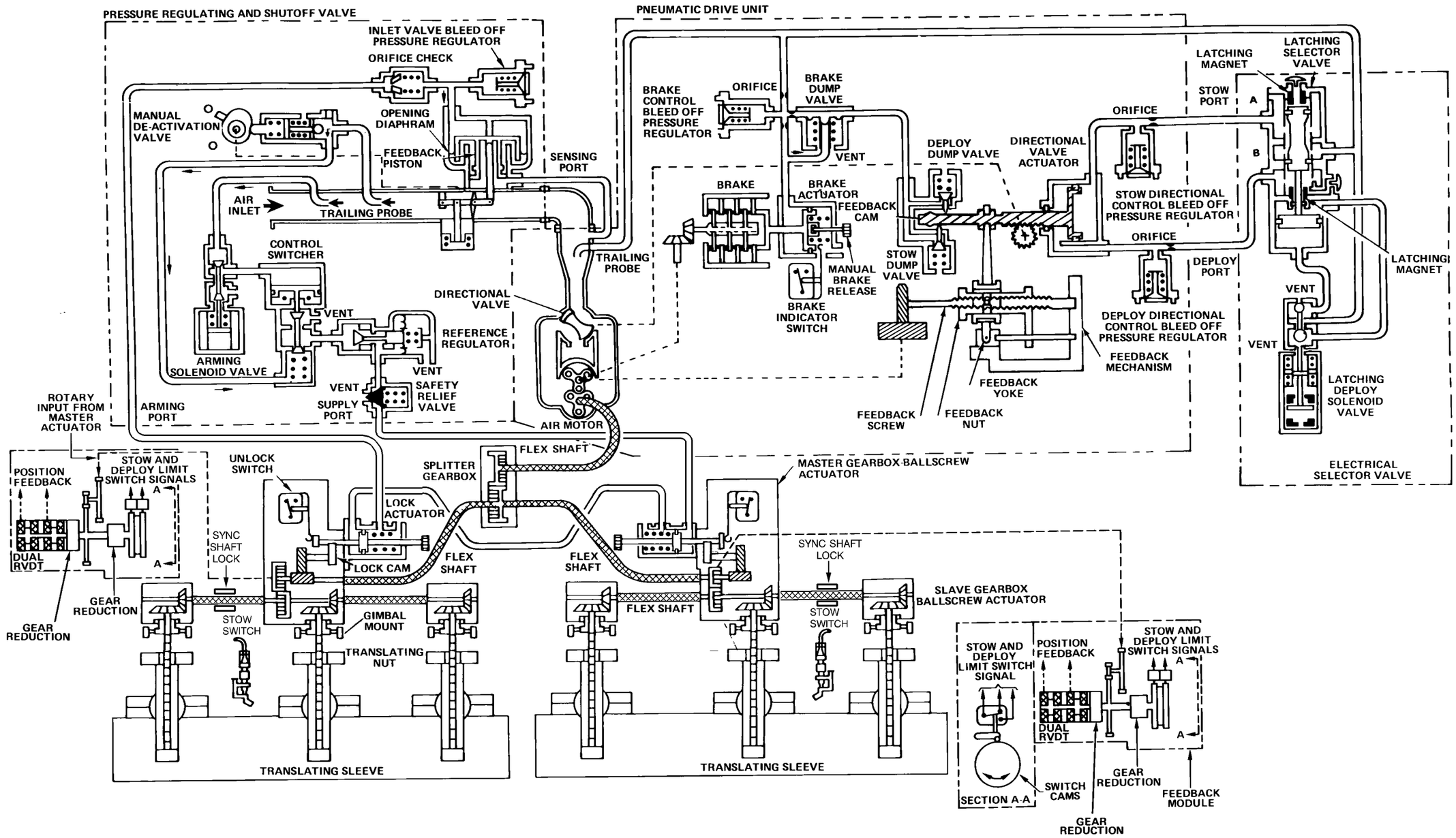
Thrust Reverser Actuation System - Deploy Mode
Figure 005



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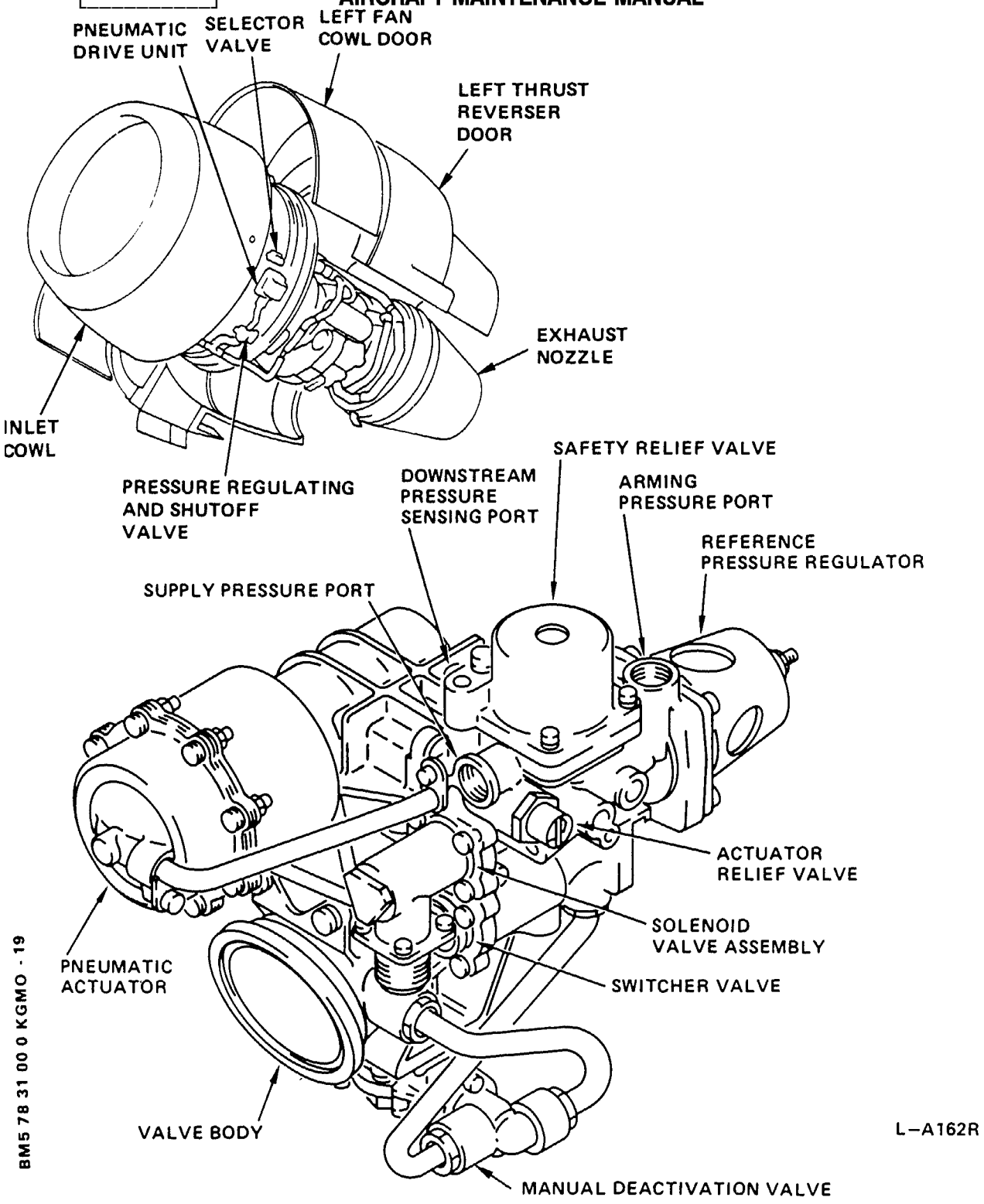
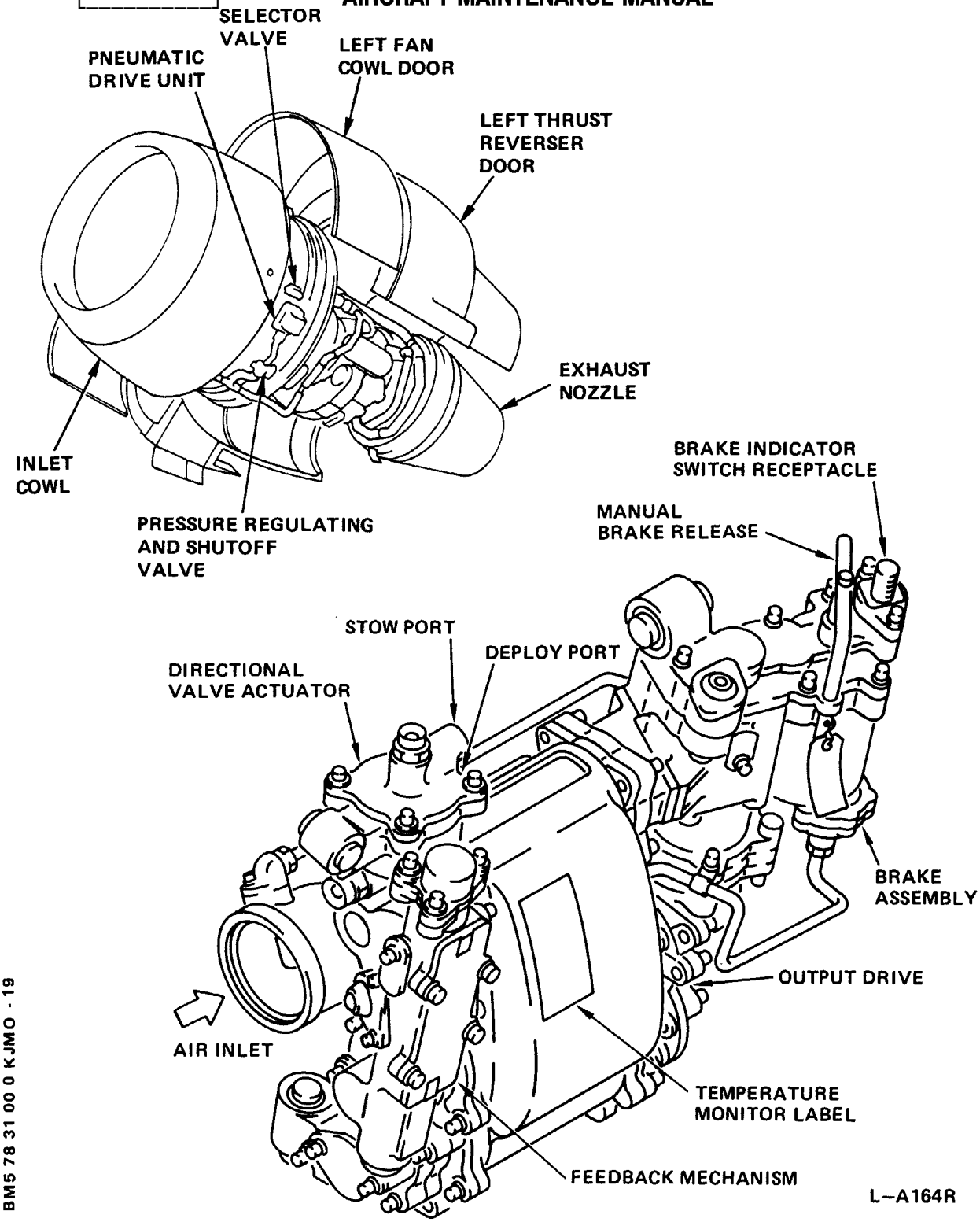
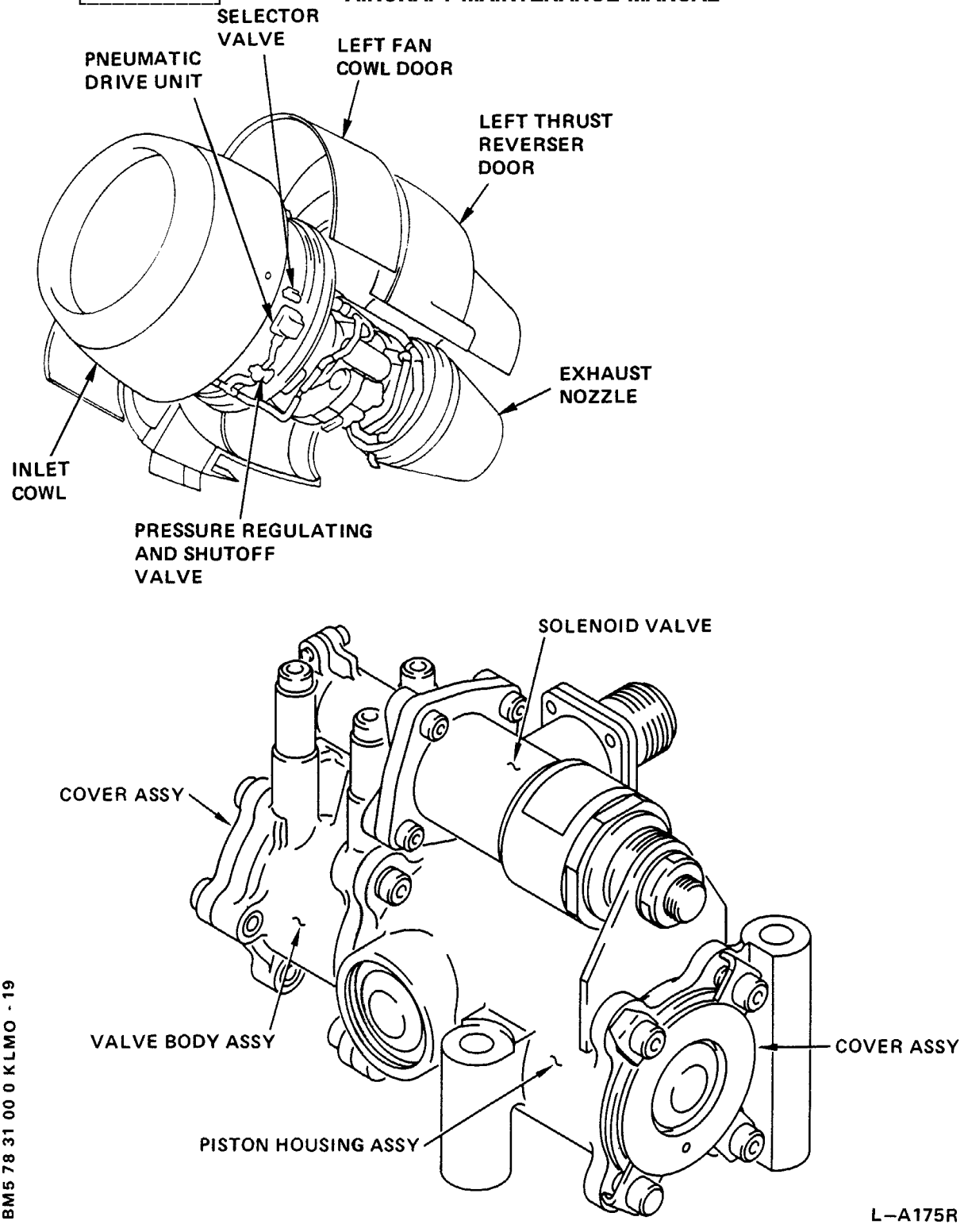
Thrust Reverser Actuation System - Stow Mode
Figure 006



Pressure Regulating and Shut off Valve
Figure 007



Pneumatic Drive Unit
Figure 008



Selector Valve
Figure 009

reverser sleeve driftback and preclude subsequent reverser deployment. Should the master actuator ballscrew move 1/8-inch out of the locking cam within the master actuator, the secondary locking mechanism automatically begins latching to prevent release of the secondary lock. Latching is complete at 1/2-inch of sleeve driftback travel at which time further system movement is prevented.
Although the aircraft reverser control system is designed to prevent receipt of an inadvertent in flight deploy command, a combination of multiple failures could result in reverser system deployment. An inadvertent reverser deployment inflight will be apparent by observation of appropriate reverser unlock light, and subsequent reverser deployment signals. In addition, the power for the affected engine would be returned to idle. Reverser in flight stow procedures under these circumstances are similar to those for landing stow operation of the reverser.

D. Thrust Reverser System Electrical Supply

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The reverser system supply within the general electrical system supply is detailed in (Ref. Fig. 011).

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The location of the relevant circuit breakers on the circuit breaker panel is shown in (Ref. Fig. 010).

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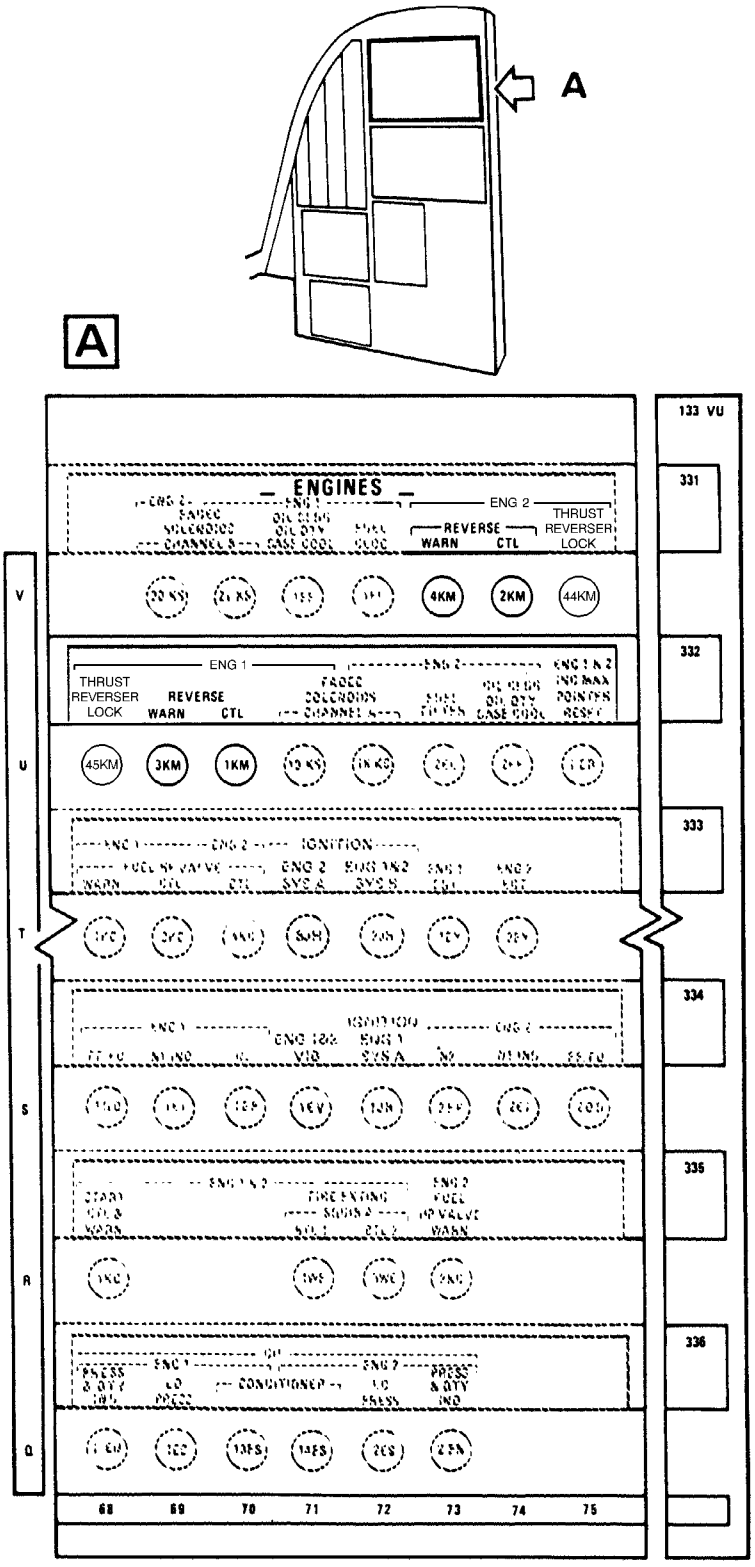
E. Electrical Control (described for engine 2) (Ref. Fig. 012, 014)
(1)Deployment
A command to deploy the thrust reverser closes the switch (14KM) which allows energization of the arming solenoid provided the main gear squat switch (16GB) is pressed (ground condition).
At the same time a second switch (8KM) is activated by the same command to energize the deploy solenoid. This is possible only with the other main gear squat switch (13GB) closed.
When the sleeves are out of the stowed position, stow switches close and REV UNLK amber warning comes on.
The deploy switches remain in the stowed position while the reverser is deploying. When the reverser is nearly fully deployed, the deploy switches are tripped, the REV UNLK amber warning light goes off and REV green light comes on.
(2)Stowage



Circuit Breakers - Location
Figure 010

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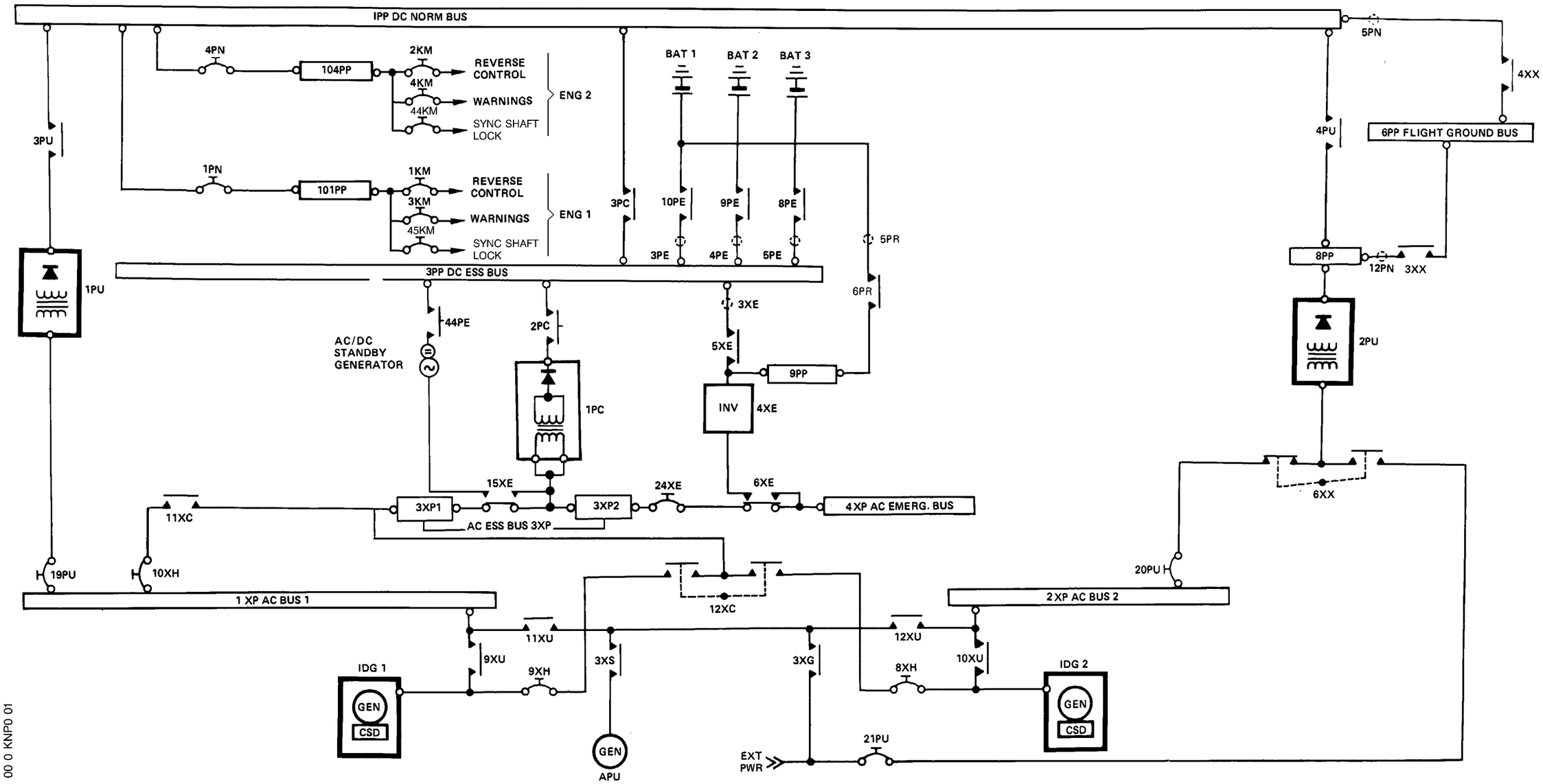

BM5 78 31 00 0 KNP0 01

Thrust Reverser System - Electrical Supply
Figure 011

When the commanded switches (14KM and 8KM) are in the stow position after a stow order and when switch (16KM) is closed, the arming solenoid and the stow solenoid are energized.
The thrust reverser is actuated to the stowed position, with REV UNLK illuminated. When the sleeves reach the stowed position, sleeve stow switches open, this de-energizes the arming solenoid allowing the brake and locks of the actuation system to become operative.
If for any reason a thrust reverser sleeve leaves the stowed position in flight, the stow switch (S301 for RH sleeve or S307 for LH sleeve) closes. In this condition, the arming solenoid will be energized together with the stow solenoid by the corresponding relay and switch. The thrust reverser will be actuated to the stowed position.

(3)Locking

Two separate locking provisions are provided within the thrust reverser system. The primary means of holding the system stowed is provided by a brake in the pneumatic drive unit. Normally, it is spring-loaded in the brake applied position, preventing air motor rotation and resulting reverser translation. The brake is also applied to secure the system once the fully deployed position is reached. To release the brake, pressurization of the release chamber is required.
A system secondary locking feature is incorporated into each reverser master actuator. The master actuator locks function only in the reverser stowed position, guarding against reverser sleeve driftback in the event of an air motor, splitter gearbox, master actuator or flexshaft failure.
During normal thrust reverse operation, the locks are released by pressurizing the lock actuator chambers.
The thrust reverser master actuators contain cranking provisions to allow manual translation of the reverser sleeves. In order to accomplish this, the pneumatic drive unit primary brake and both of the master actuator secondary system locks must be manually released and held to allow sleeve movement.

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E. Electrical Control (described for engine 2) (Ref. Fig. 013, 015)

(1)Deployment

A command to deploy (reverse throttle lever in the Rev Idle position) the thrust reverser closes the switch (14KM) which after 250 ms (time necessary for time delay relay 48KM (49KM) to close), allows energization of the arming solenoid provided the main gear squat switch (16GB) is pressed (ground condition).
At the same time a second switch (8KM) is activated by the same reverse throttle command to energize the deploy solenoid and to supply the synchronous shaft lock solenoids to unlock the locks. This is possible

only with the other main gear squat switch (13GB) and 19GB closed.
When the sleeves are out of the stowed position, stow switches close and REV UNLK amber warning comes on.
The deploy switches remain in the stowed position while the reverser is deploying. When the reverser is nearly fully deployed, the deploy switches are tripped, the REV UNLK amber warning light goes off and REV green light comes on.
As protection against a maintenance fault (rod/arm incorrect installation) the throttle control lever of the other engine has to be in a position below 22 ° to cut off power supply to selector valve stow solenoid.

(2)Stowage
When the commanded switches (14KM and 8KM) are in the stow position after a stow order and when switch (16KM) is closed, the arming solenoid and the stow solenoid are energized.
The thrust reverser is actuated to the stowed position, with REV UNLK illuminated. When the sleeves reach the stowed position, sleeve stow switches open ; this de-energizes the arming solenoid allowing the brake and locks of the actuation system to become operative. Ten seconds after the stow command, the synchronous shaft locks lock again.
If for any reason a thrust reverser sleeve leaves the stowed position in flight, the stow switch (S301 for RH sleeve or S307 for LH sleeve) closes. If both switches (S301 and S307) close, the arming solenoid will be energized together with the stow solenoid by the corresponding relay and switch. The Thrust reverser will be actuated to the stowed position.

(3)Locking
Three separate locking provisions are provided within the thrust reverser system. The primary means of holding the system stowed is provided by a brake in the pneumatic drive unit. Normally, it is spring-loaded in the brake applied position, preventing air motor rotation and resulting reverser translation. The brake is also applied to secure the system once the fully deployed position is reached. To release the brake, pressurization of the release chamber is required.
A system secondary locking feature is incorporated into each reverser master actuator. The master actuator locks function only in the reverser stowed position, guarding against reverser sleeve driftback in the event of failure of an air motor, splitter gearbox, master actuator, flexshaft or synchronous shaft lock.
During normal thrust reverse operation, the locks are released by pressurizing the lock actuator chambers.
The third locking system consists of two synchronous shaft locks (one lock per sleeve), installed between the master actuator and lower slave actuator, and connected to them through flexshafts.
The synchronous shaft locks are permanently locked except during crew-commanded thrust reverser use. Upon selection of reverse thrust, the synchronous shaft locks are energized by the aircraft thrust reverser control system. The synchronous shaft locks remain energized and unlocked throughout the entire deploy cycle.
The thrust reverser master actuators contain cranking provisions to allow manual translation of the reverser sleeves. In order to accomplish this, the pneumatic drive unit primary brake, both master actuator secondary

system locks and both synchronous shaft locks must be manually released and held to allow sleeve movement.

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F. Indicating (Ref. Fig. 016, 017)
Two annunciator lights located in the flight compartment provide indication on the thrust reverser configuration. As soon as any of brake or secondary lock or stow switch is open, the fan reverser configuration is indicated by REV UNLK warning light illumination. The above warning is replaced by illumination of REV indicator light showing that the thrust reverser is fully deployed as soon as deploy switch is open. No indication is on when the translating sleeve is fully stowed.
In addition, the signal sent from the FADEC to the ECAM system provides indication of the sleeves position on the CRT (Ref. Fig. 018).
There is no indication in the flight compartment associated with the synchronous shaft locks.

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G. Throttle Control Feedback (Ref. Fig. 019, 020, 021)
The master actuator of each thrust reverser duct half incorporates a feedback mechanism which provides reverser position feedback to the FADEC. This mechanism consists of a self-contained dual rotary variable differential transformer (RVDT) (see detailed description in paragraph H. and I.), integral reduction gearing and mechanically activated electrical switches for stow and deploy indication, which attach to the thrust reverser master actuators (two off) at the mechanical feedback gear drive pad. Both RVDT output signals are wired to both A & B channels of the FADEC. In addition, the FADEC receives throttle lever resolver signals, according to throttle control lever position.
As the reverser translates through deploy and stow, each master actuator internal gearbox drives an RVDT in direct relation to translating sleeve travel. The RVDT provides an electrical signal feedback via an electrical harness to the FADEC (Ref. Fig. 020).
In reverser deploy command, (Ref. Fig. 019) the FADEC software logic maintains an approach idle fuel flow setting until a signal indicating 78% of full deployment is received. Maximum reversing fuel flow cannot be attained until 90% of full deployment is indicated (Ref. Fig. 021).
In reverser stow command (Ref. Fig. 019), the FADEC software logic maintains idle fuel flow until an 85% stowed indication is received. Maximum forward power cannot be attained until a 90% stowed signal is received (Ref. Fig. 021). Should an uncommanded deploy occur, the FADEC will com-

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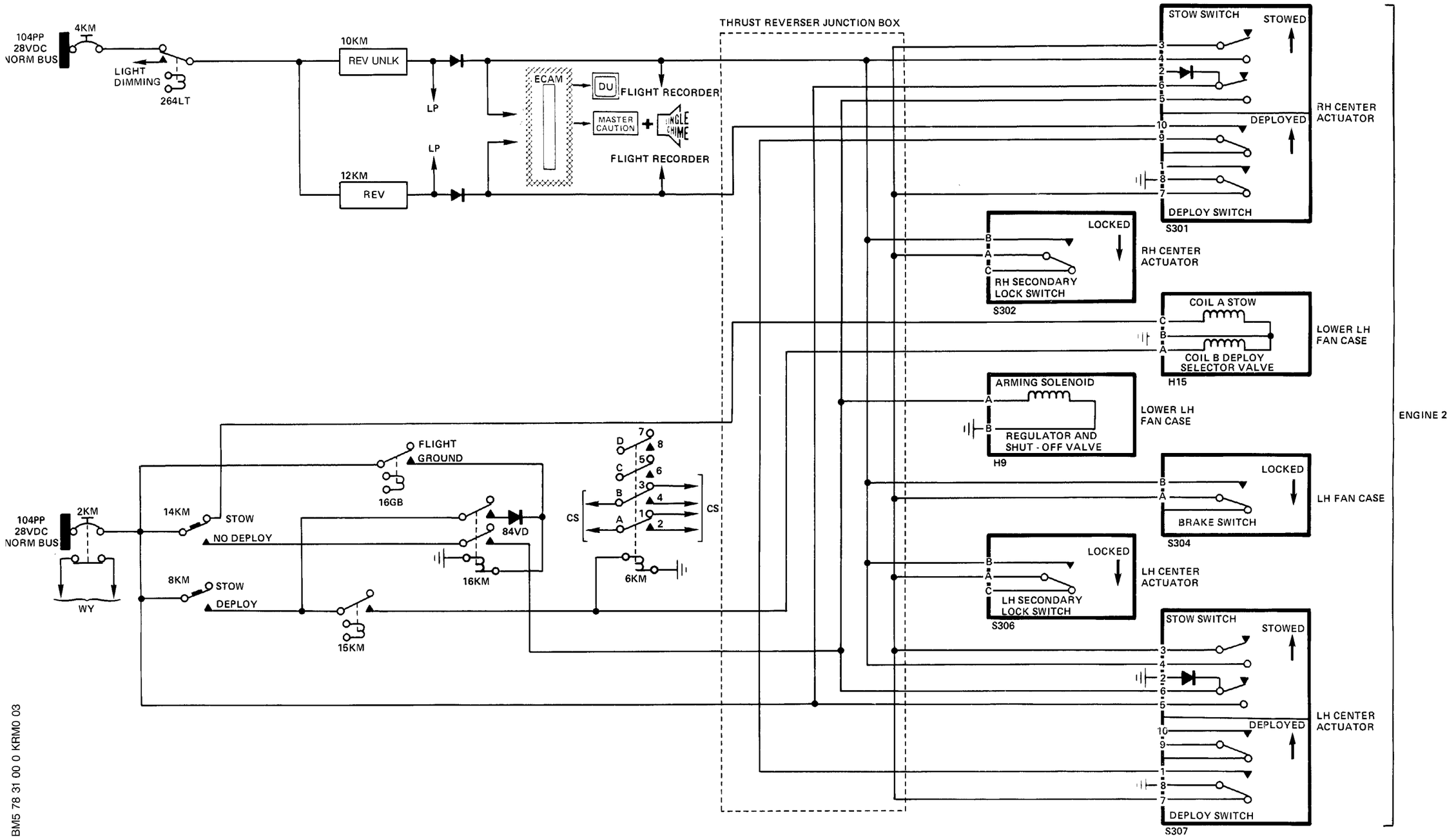

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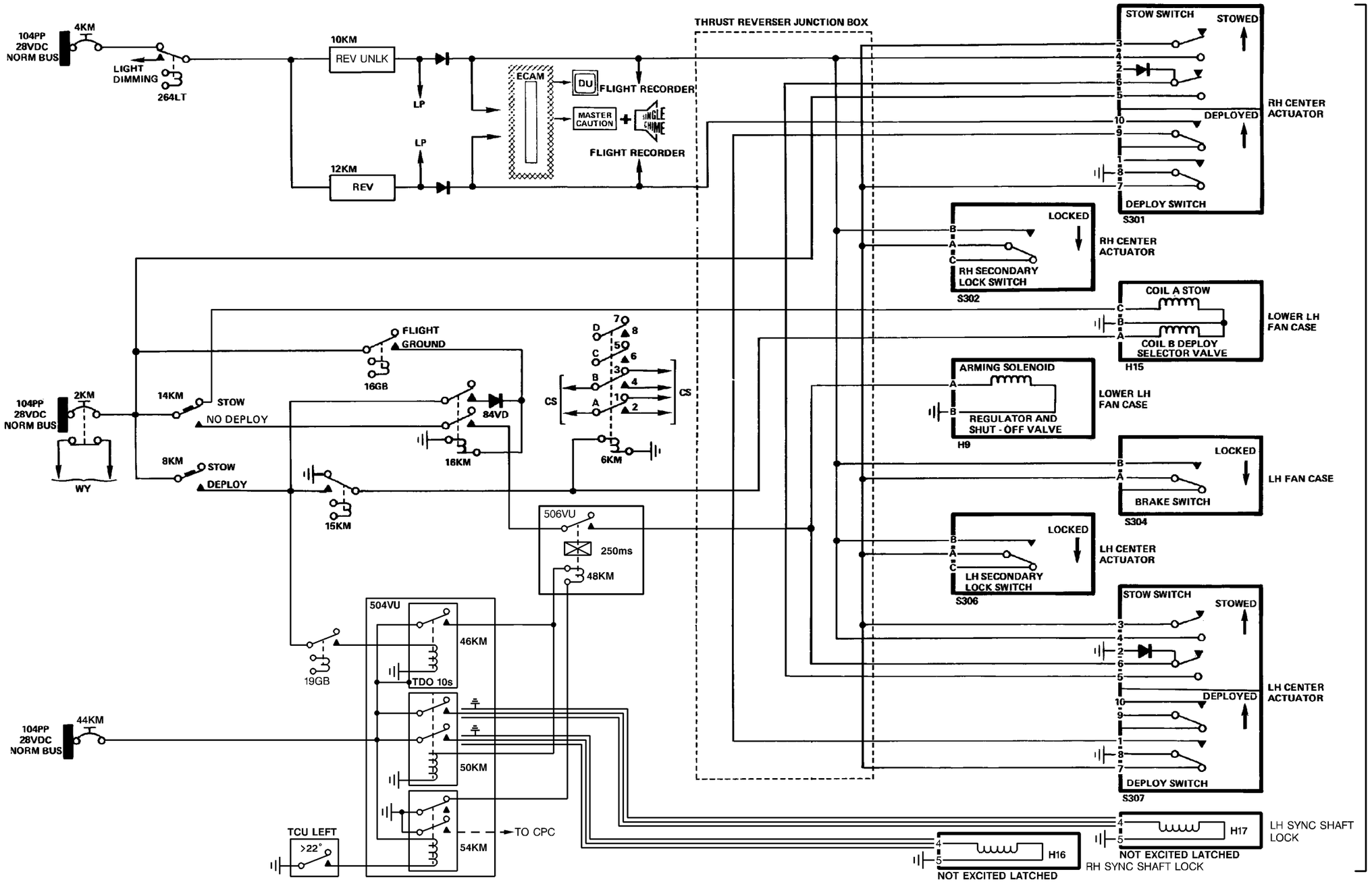
Thrust Reverser Control and Indicating, ENG2
Aircraft on Ground, No Electrical Power
Figure 012

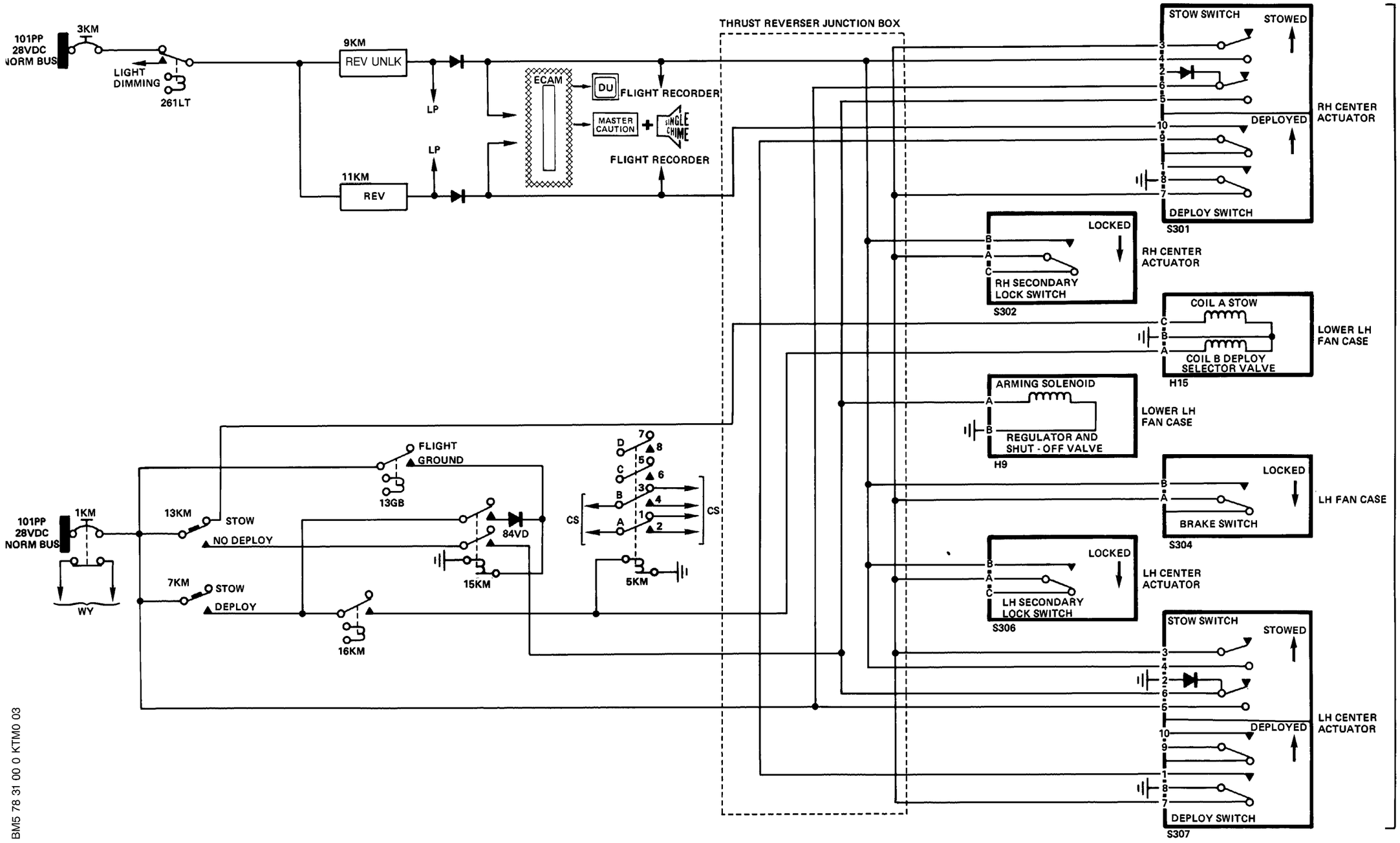
R



BM5 78 31 00 0 KRX0 04

Thrust Reverser Control and Indicating, ENG2
Aircraft on Ground, No Electrical Power
Figure 013

R



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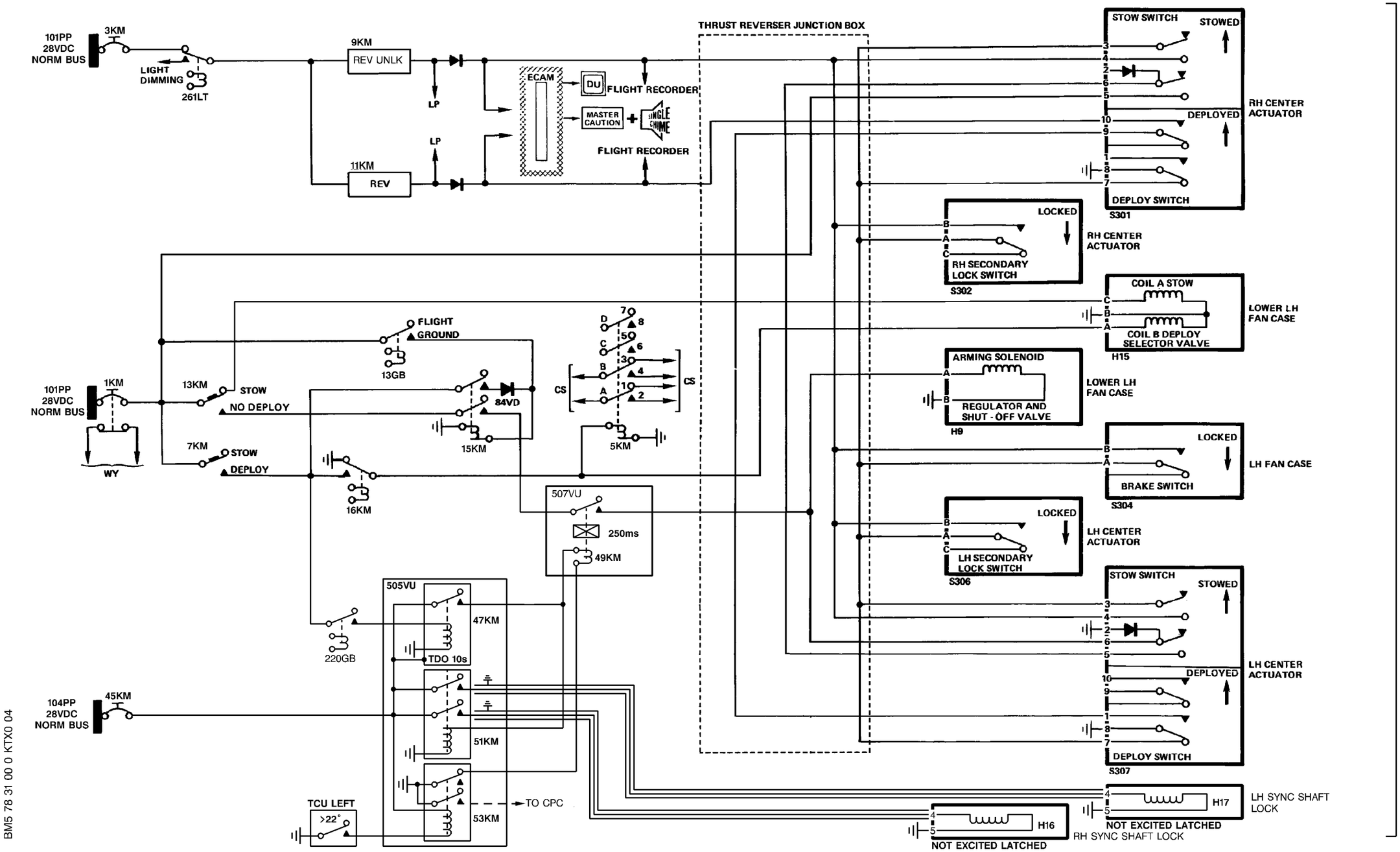
Thrust Reverser Control and Indicating, ENG1
Aircraft on Ground, No Electrical Power
Figure 014

R



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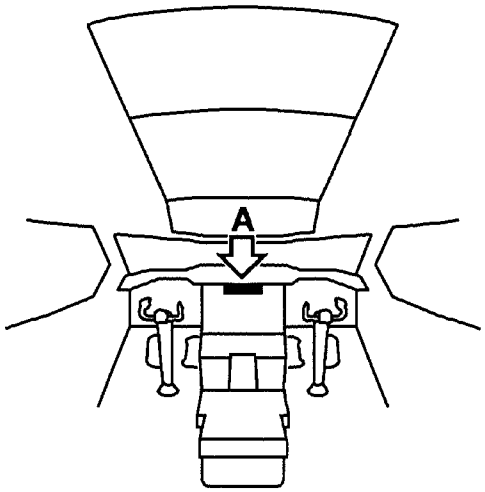
Thrust Reverser Control and Indicating, ENG1
Aircraft on Ground, No Electrical Power
Figure 015

R



A

REV	REV UNLK	REV UNLK	REV

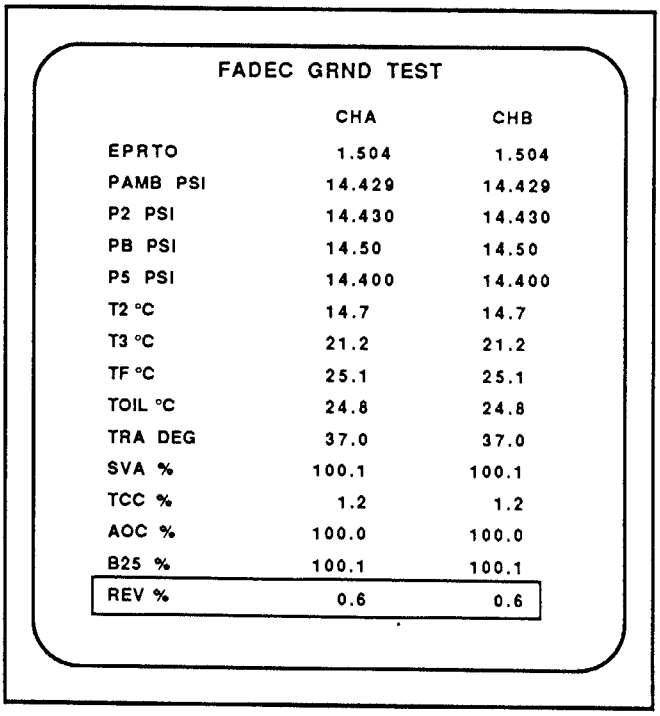
BM5 78 31 00 0 KVMO - 00

Thrust Reverser Indicating
Figure 016

OPERATION	REVERSER UNLOCK (AMBER)	REVERSER THRUST (GREEN)
DEPLOY CYCLE		
1. PRIOR TO SELECTION OF DEPLOY	OFF	OFF
2. A. MASTER ACTUATORS UNLOCKED B. PDU UNLOCKED	ON	OFF
3. STOW SWITCHES DE-ACTUATED	ON	OFF
4. DEPLOY SWITCHES ACTUATED	OFF	ON
STOW CYCLE		
5. DEPLOY SWITCHES DE-ACTUATED	ON	OFF
6. STOW SWITCHES ACTUATED	ON	OFF
7. CENTER ACTUATORS LOCKED PDU LOCKED	OFF	OFF

BM5 78 31 00 0 KXMO - 19

Deploy/Stow Cycle - Indicating
Figure 017



BM5 78 31 00 0 KZMO - 20

R ECAM Display unit - GND TEST
Figure 018

mand idle fuel flow regardless of throttle position (Ref. Fig. 021).

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H. Rotary Variable Differential Transformer (RVDT)
(Ref. Fig. 022, 023, 024)
The RVDT provides a signal to the FADEC which is proportional to actuator percent deployed. The zero percent deployed position is equivalent to the actuator fully stowed on its stops. The 100 percent deployed position corresponds to 20.84 in. (529.3 mm) of actuator stroke. The RVDT assembly also contains limit switches which indicate stowed and deployed position and also control the arming solenoid of the pressure regulator and shutoff valve.
One RVDT/switch assembly is mounted on each right and left master actuator. The unit operates as described when mounted on the master actuator gearbox (Ref. Fig. 024). The RVDT is a dual unit to accommodate channel A and B inputs to the FADEC. For each channel, the primary (input) coils of the left and right units are wired in parallel and the secondary (output) coils are wired in series (Ref. Fig. 024).

I. Stow and Deploy Switches
A stow switch for each reverser half is set such that the switch contacts close between 0.150 in. and 0.300 in. (3.81 mm and 7.62 mm) of actuator stroke as the reverser is deployed. The switch contacts open between 0.500 in. and 0.150 in. (12.70 mm and 3.81 mm) from stow as the reverser is stowed.
A deploy switch for each reverser half contact closes at 95 percent ±2 of the deployed position as the reverser deploys. When the reverser stows, the contacts open at or before 90 percent of the deployed position.

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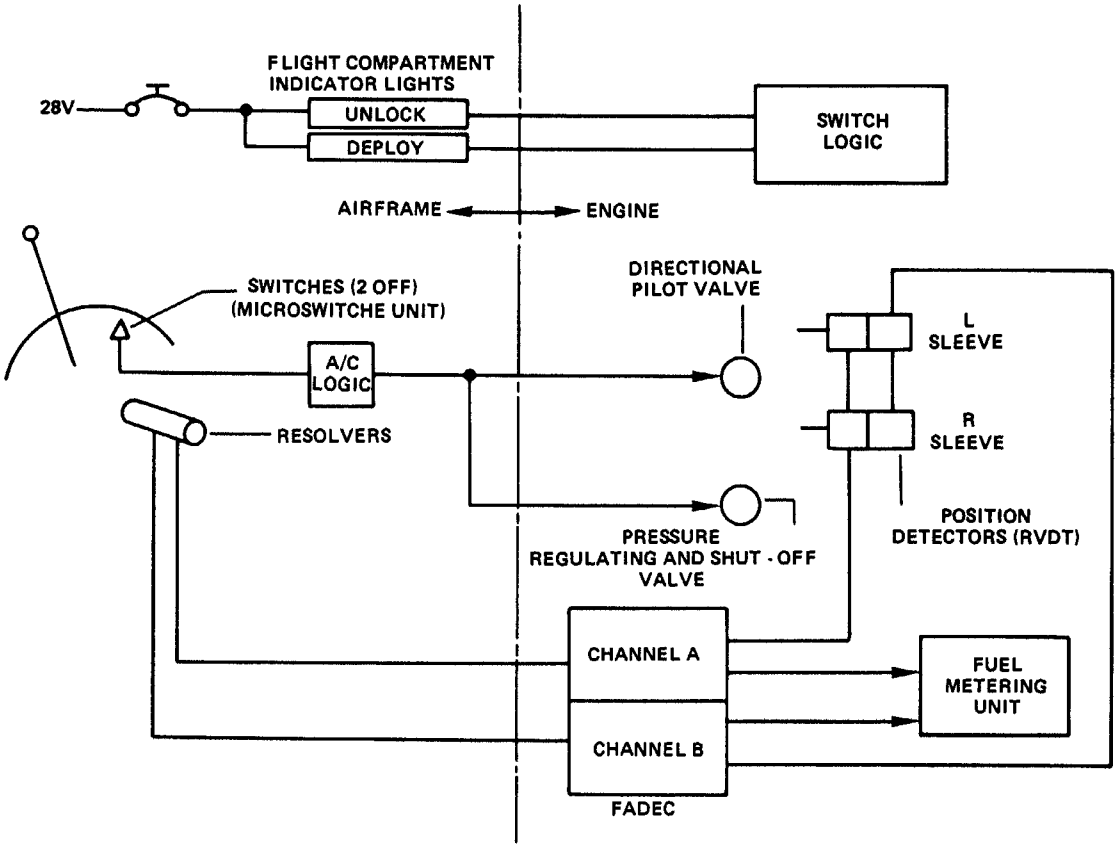
J. Synchronous shaft Lock
(1)Description
The thrust reverser synchronous shaft lock system on each engine consists of an electric synchronous shaft lock (sync lock) on each T/R sleeve and the wiring harness containing the synchronous shaft lock solenoid command wiring.
The system includes associated brackets and clips to secure the locks and wiring harnesses to the engine and T/R. The fan cowl doors also incorporate adhesively bonded metallic skid plates that protect the composite structure in the event that the manual unlock lever is not returned to the locked position after maintenance.
The synchronous shaft locks are installed in the actuation system of each T/R half. The synchronous shaft locks are bracket-mounted to the T/R torque box between the master actuators and the lower slave actuators.



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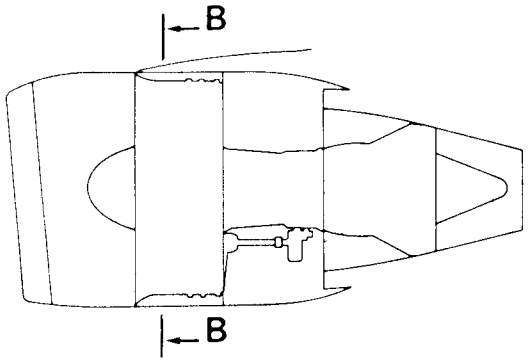
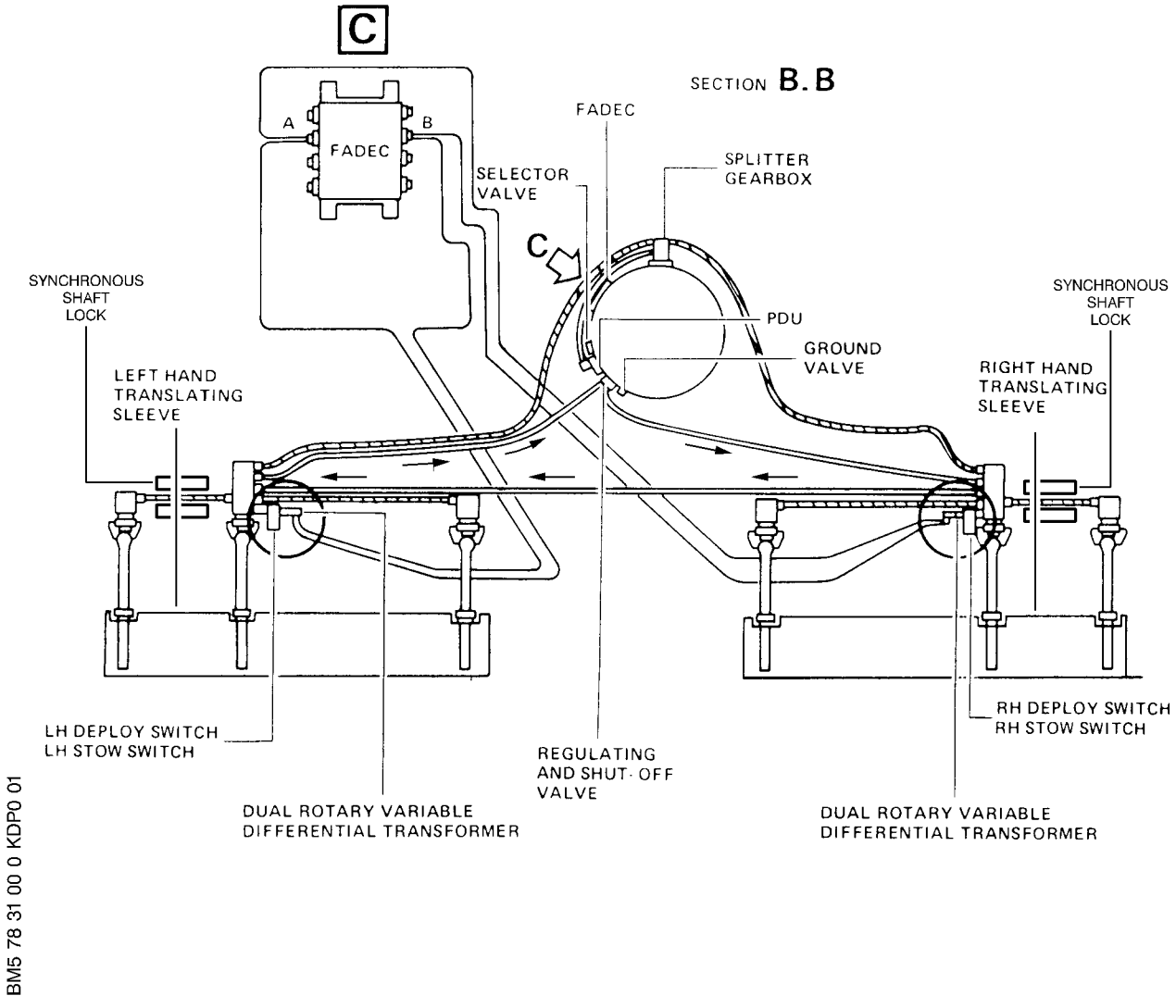
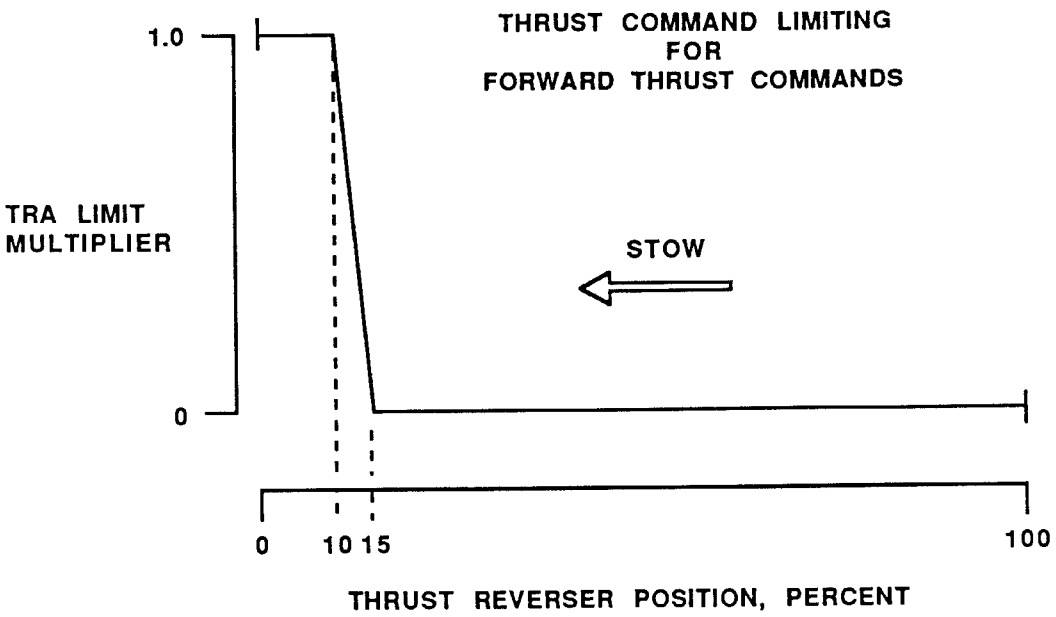
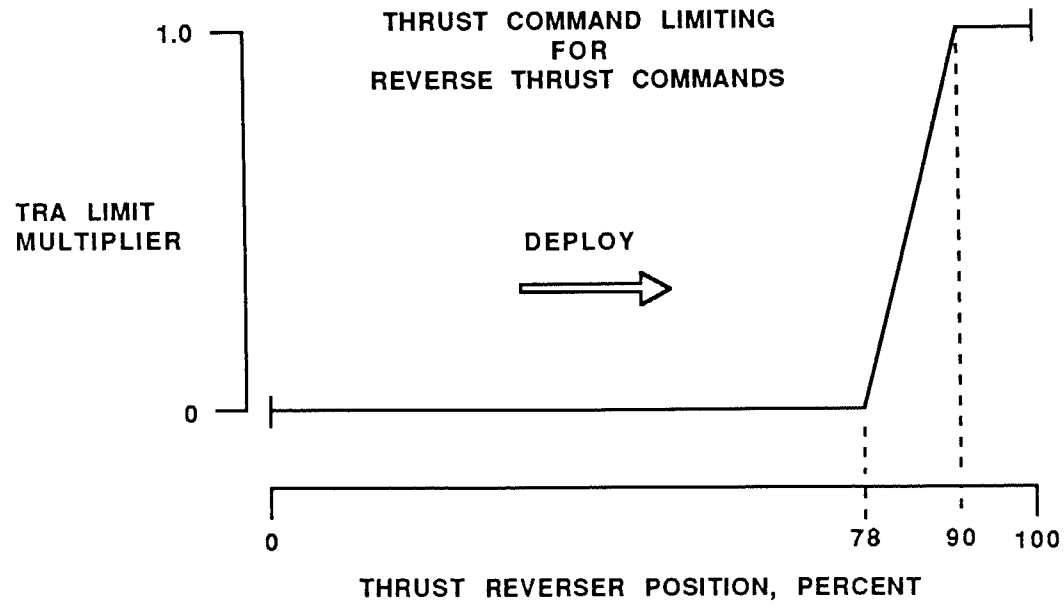
FADEC Interface with Thrust Reverser
Figure 019





Thrust Reverser System Block Diagram
Figure 020





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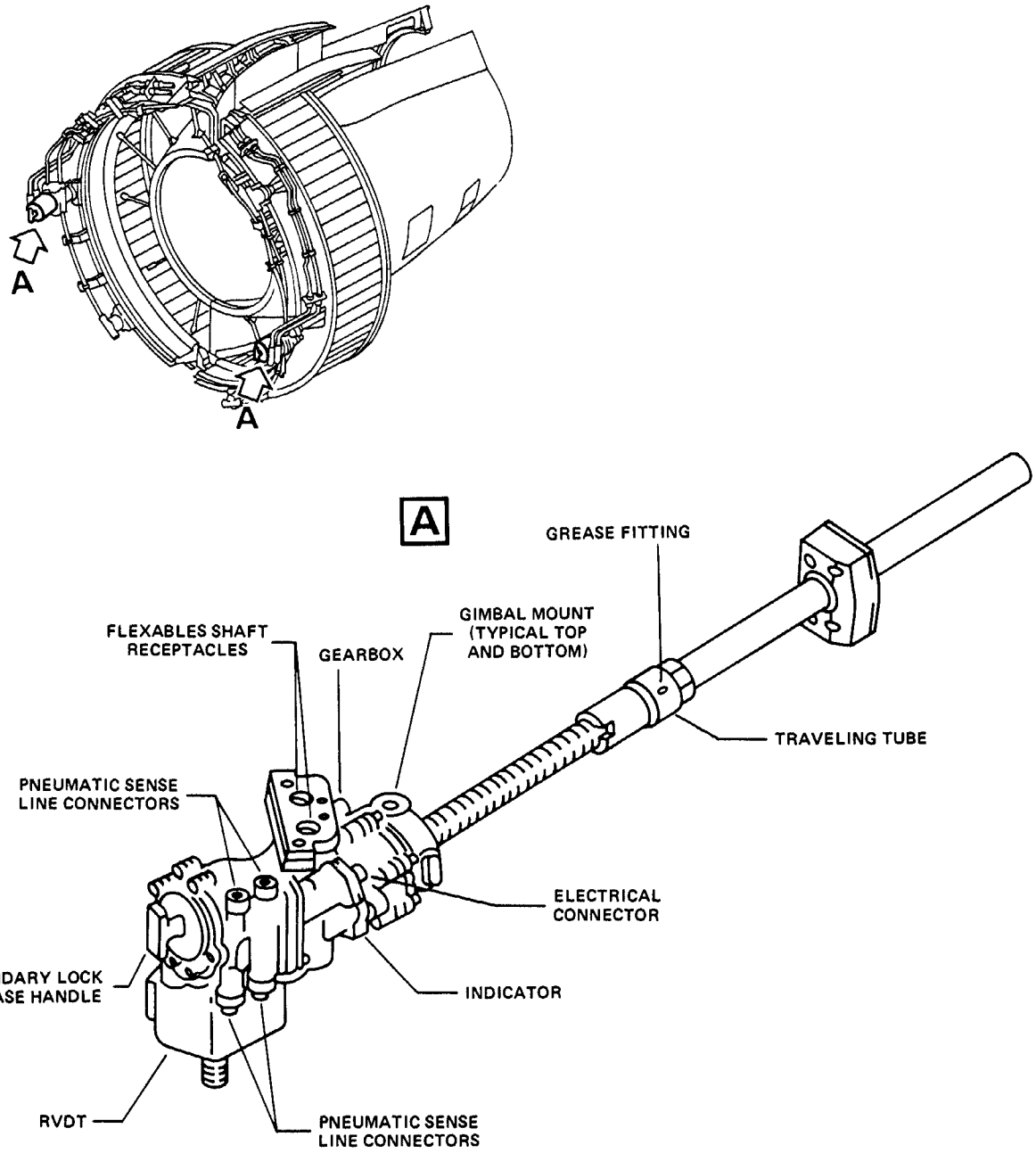
Thrust Limiting During Reverser Transition
Figure 021



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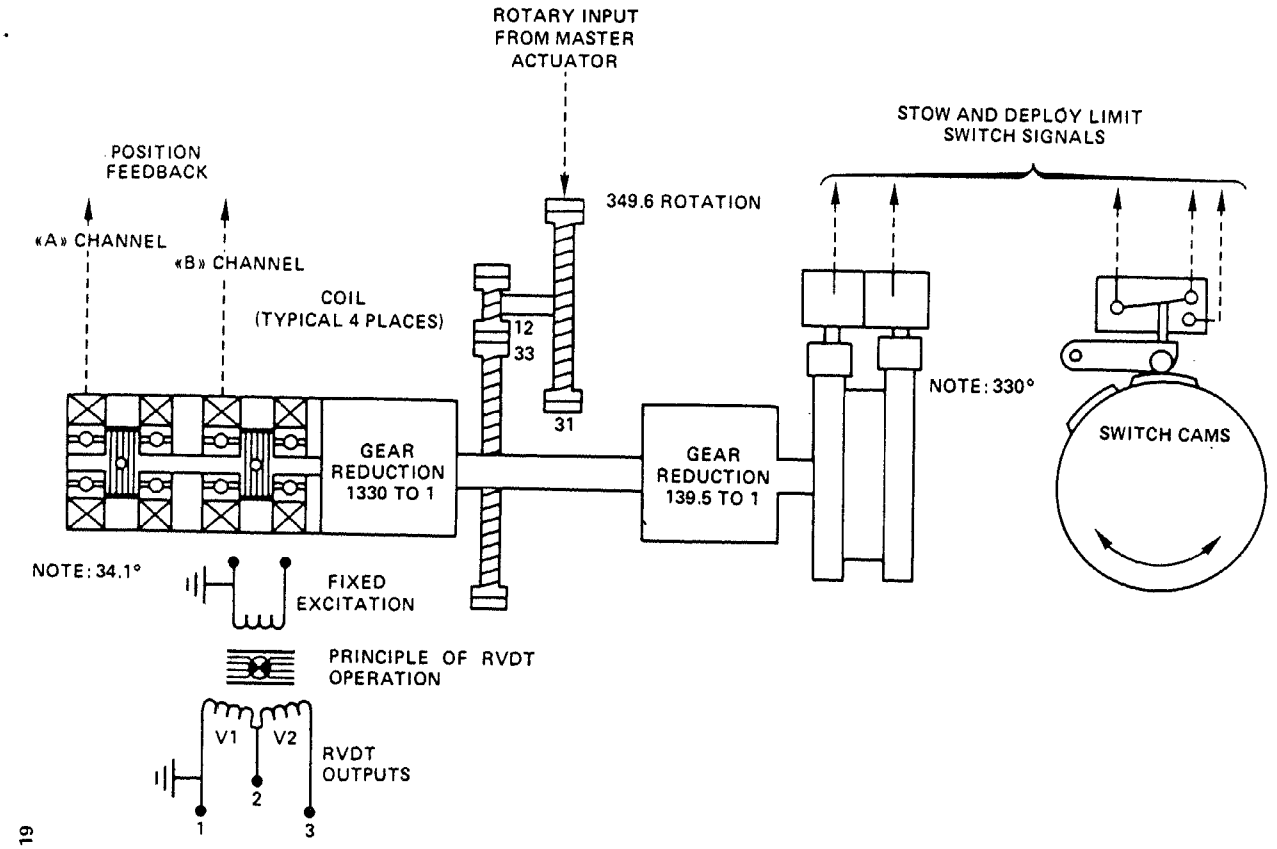
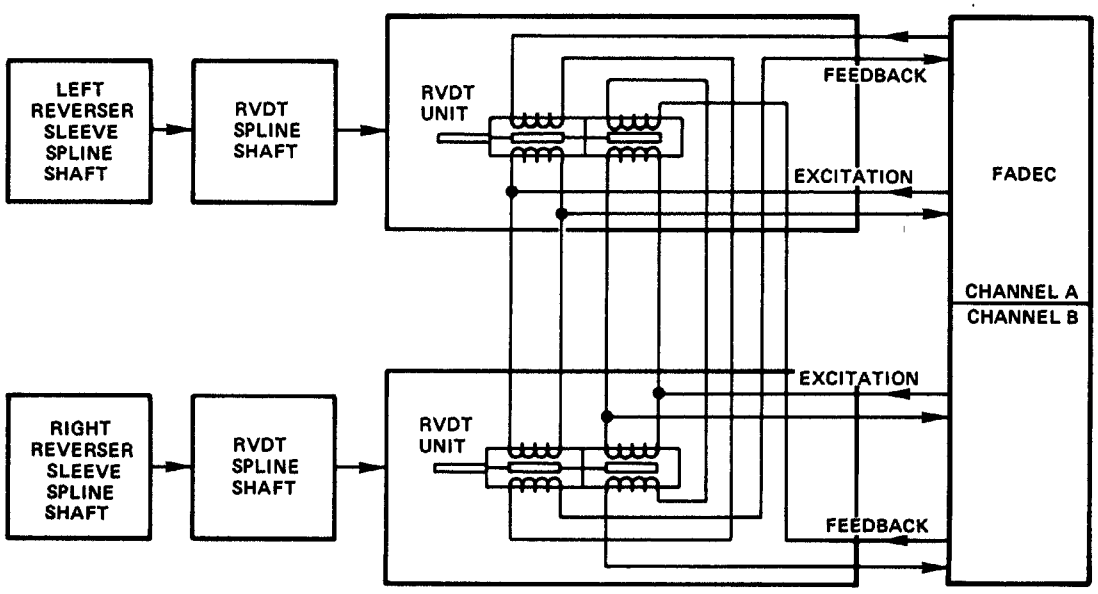
RVDT Location
Figure 022



RVDT Feedback Module - Schematic
Figure 023



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RVDT Electrical Wiring
Figure 024

Each synchronous shaft lock interfaces with the actuation system through two flexshafts : one flexshaft interconnects between the slave actuator and the synchronous shaft lock and the second flexshaft interconnects between the synchronous shaft lock and the master actuator.
The wiring harness starts at connector number D497OP at the fan area pylon interface and terminates in connectors at each synchronous shaft lock.

(2)Operation (Ref. Fig. 025, 026)
The synchronous shaft lock is a solenoid-operated unit which in the normal, de-energized state, prevents T/R operation. The synchronous shaft lock incorporates an internal rotor with a three-lobed rotor plate near one end. In the locked state, the rotor plate is prevented from rotation by two lock pins that block rotation of the rotor plate. The interconnecting flexshafts interface with the rotor such that the flexshafts are inhibited from rotation if the synchronous shaft lock is locked. When energized, the solenoid pulls in the solenoid armature which simultaneously pulls the lock pins out of the path of rotation of the rotor plate thereby allowing T/R operation. In the event of system failures resulting in an uncommanded deploy such that the PDU is outputting full stall torque, each synchronous shaft lock is capable on its own of retaining both thrust reverser sleeves in the stowed position.

(3)Manual unlock lever (Ref. Fig. 027, 028)
In order to manually deploy the T/R for maintenance work, both synchronous shaft locks must be unlocked. Each synchronous shaft lock has a manual unlock lever that, when rotated, mechanically moves the solenoid armature to the unlock position, pulling the lock pins clear of the rotor plate. The manual unlock lever is held in either the normal or unlocked position by a ball detent at the base of the lever. In the event that the manual unlock lever is not returned to the normal position after maintenance, closure of the fan cowl door will push the lever to the normal position thus assuring dispatch with the synchronous shaft lock properly locked.

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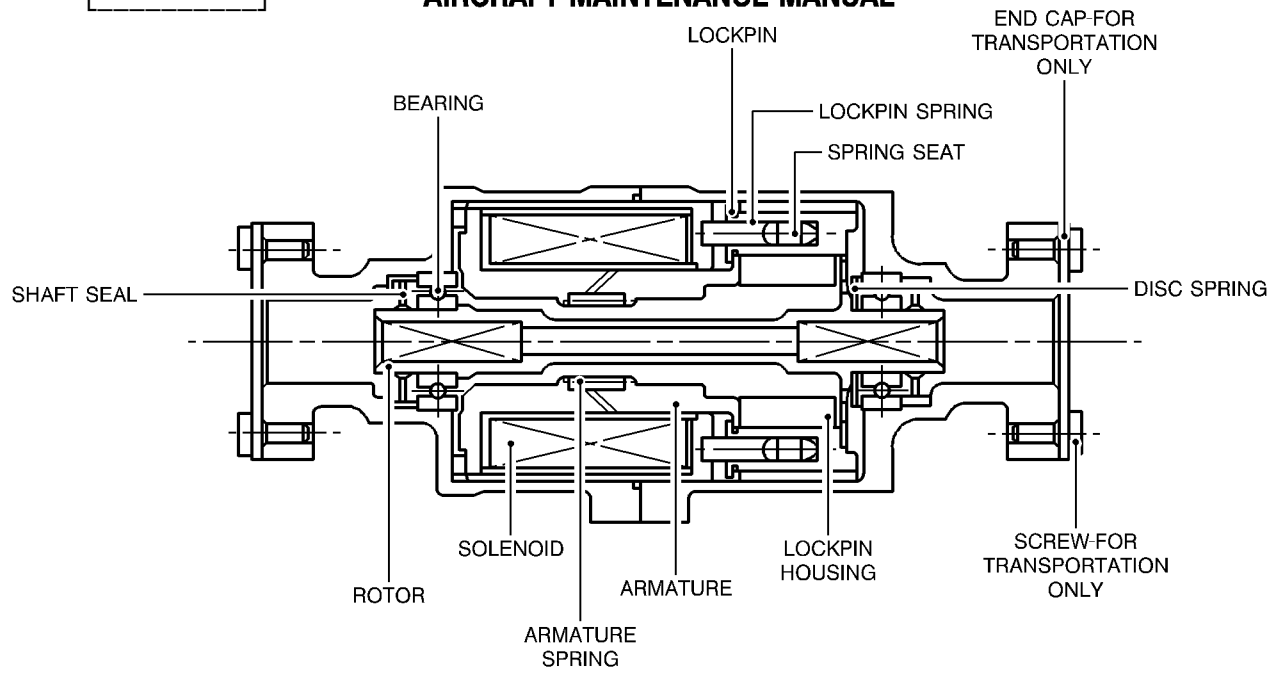
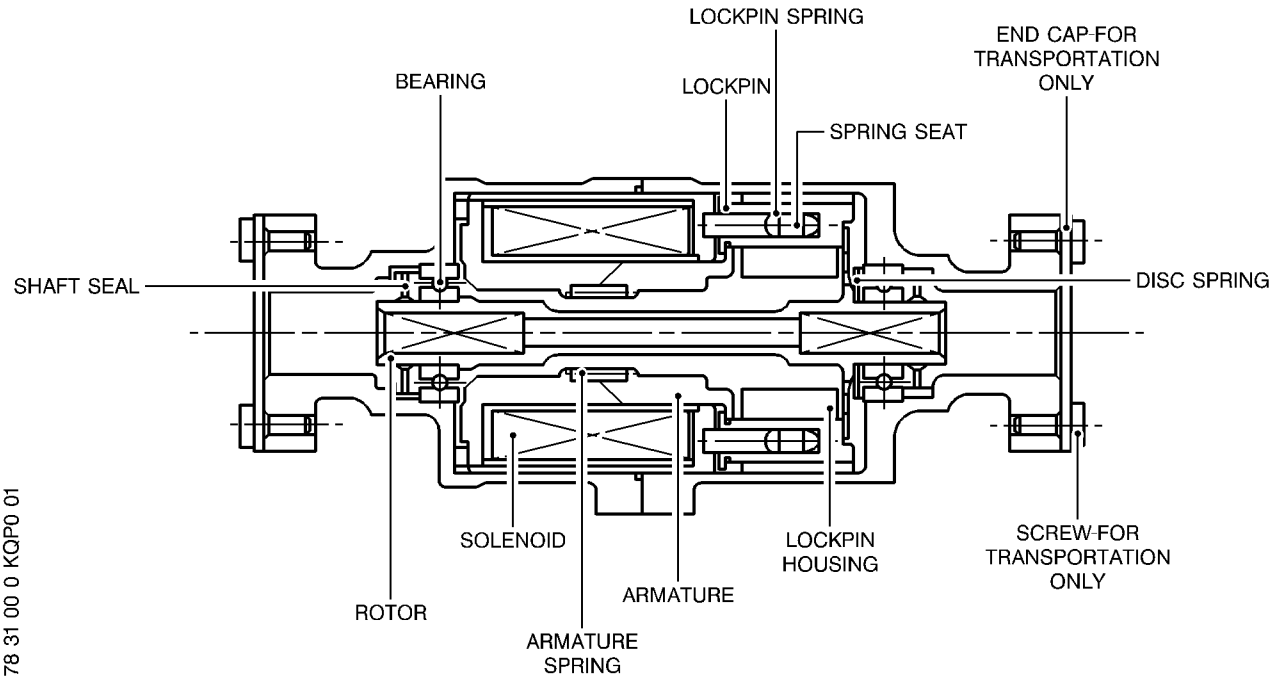


LOCKED (SOLENOID NOT ENERGISED)



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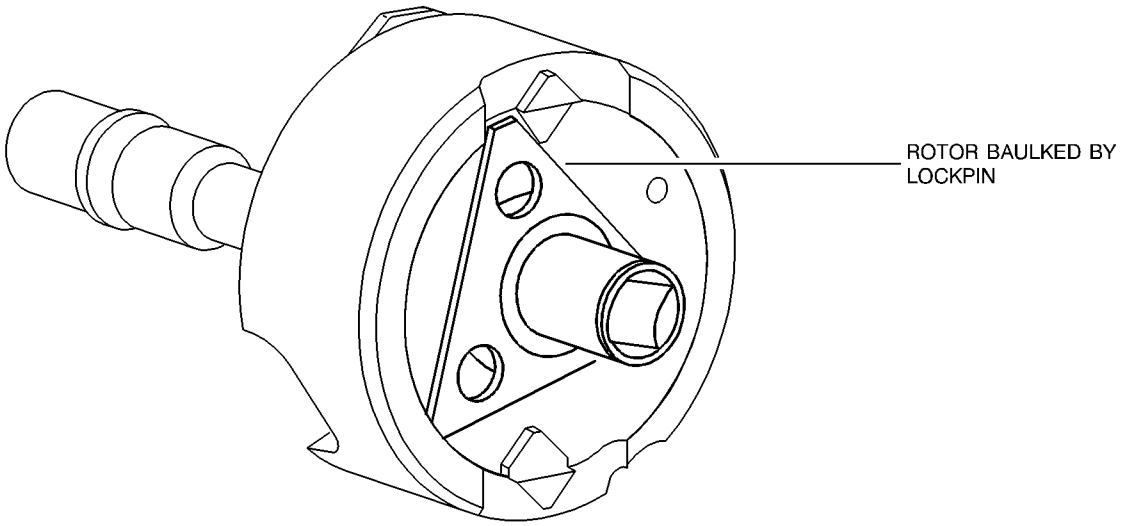
UNLOCKED (SOLENOID ENERGISED)

Synchronous Shaft Lock
Figure 025



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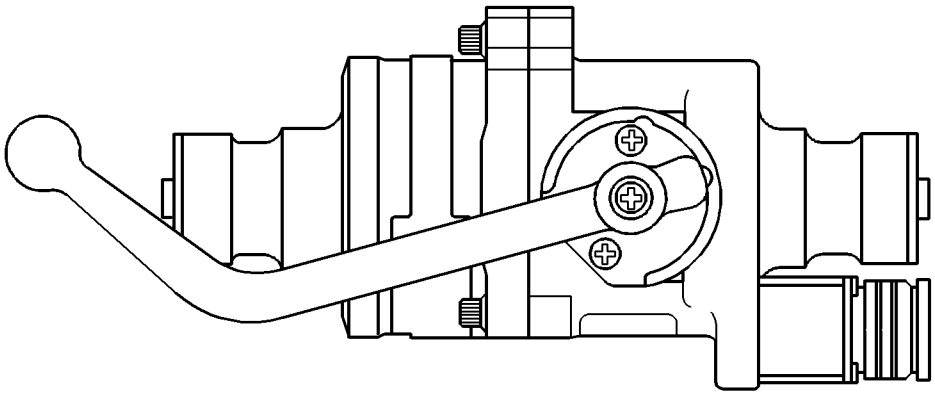
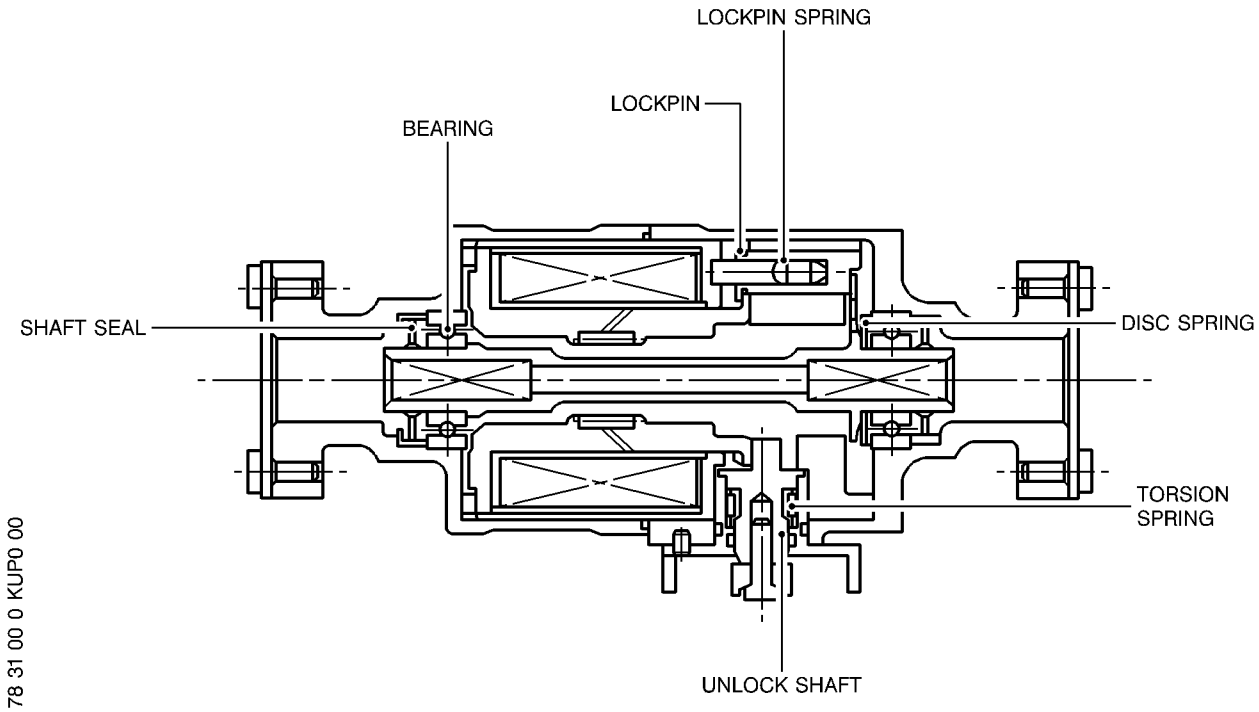
Synchronous Shaft Locking Concept
Figure 026





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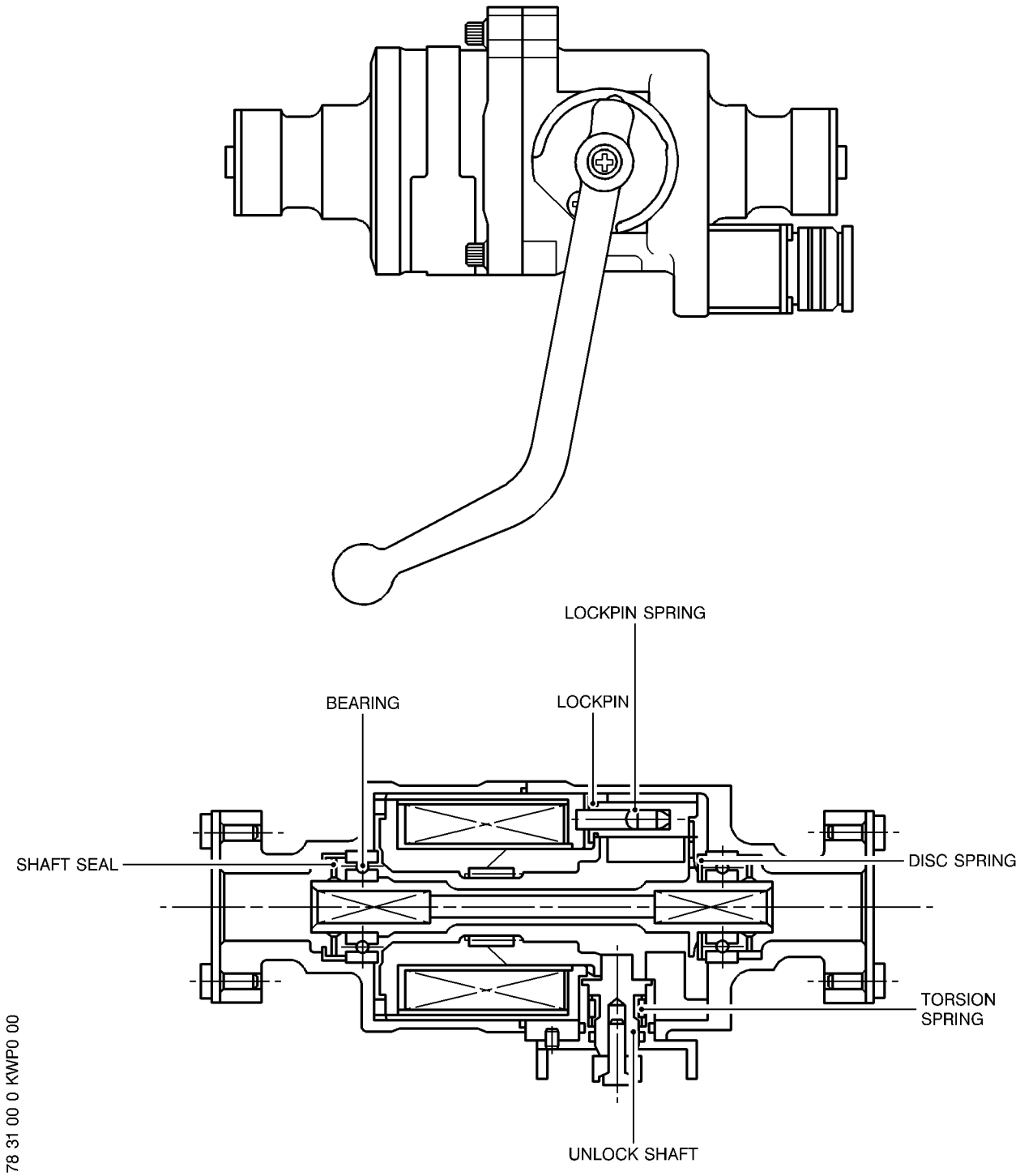
Manual Unlock Lever - Normal Position
Figure 027



Manual Unlock Lever - Unlocked Position
Figure 028

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THRUST REVERSER ACTUATION SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure provides instructions for adjusting the thrust reverser actuation system, starting with disconnection of the actuator drive cables, continuing through sequential adjustment of system components, and ending with a system test.

B. The following maintenance practices and removal/installation procedures are applicable to reverser actuation system component replacement :
(Ref. 78-31-01, P. Block 401)
(Ref. 78-31-12, P. Block 401)
(Ref. 78-31-15, P. Block 401)
(Ref. 78-31-35, P. Block 401)
(Ref. 78-31-40, P. Block 401)
(Ref. 78-31-41, P. Block 401)
(Ref. 78-32-12, P. Block 401)

C. Adjustment is required after a major component of the actuation system is removed and replaced as described in the maintenance practice or removal/installation procedures noted in step B. here above. Refer to the applicable section to proceed with the adjustment of that specific actuation component.

D. Adjustment of the thrust reverser actuation system requires opening the fan cowl doors (Ref. 71-13-00, P. Block 301), for fan cowl door opening and closing procedures.

2. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B. RSE1079	Hose, Ground Transfer Air
C.	Rig Pin, 0.25 in. (6.35 mm) Diameter, 2 in. (50.8 mm) Long
D.	Wrench, 3/8 in. (9.5 mm) Hex
E.	Ohmmeter
F. Material No.P09-013	Sealants (Ref. 70-00-00)
G.	Torque Wrench
H.	Wedges
Referenced Procedures	
- 24-41-00, P. Block 301	AC External Power Control
- 49-00-00, P. Block 501	Airborne Auxiliary Power - General
- 71-00-00, P. Block 501	Power Plant - General

ITEM	DESIGNATION
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-01, P. Block 401	Pneumatic Drive Unit
- 78-31-12, P. Block 401	Fan Reverser Flexible Shaft Assembly
- 78-31-15, P. Block 401	Master and Slaved Actuators
- 78-31-35, P. Block 401	Splitter Gearbox
- 78-31-40, P. Block 401	Switch Assembly RVDT and Stow/Deploy
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-12, P. Block 401	Thrust Reverser Cascades
- 78-32-16, P. Block 401	Thrust Reverser Cascade Support Frame Assembly

3. Adjust Thrust Reverser Actuation System

CAUTION : DISCONNECT THE AIR POWER SUPPLY BEFORE ADJUSTING THE THRUST REVERSER ACTUATION SYSTEM. DO NOT ATTEMPT TO MANUALLY MOVE THE SLEEVES WHEN AN AIR SUPPLY IS CONNECTED TO THE PNEUMATIC DRIVE UNIT (PDU). A POWER SURGE COULD CAUSE SERIOUS INJURY TO PERSONNEL.

A. Job Set-Up

(1)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).

B. Procedure (Ref. Fig. 501, 502, 504)
(Ref. Fig. 505, 506, 507)
(Ref. Fig. 508, 509, 511)
(Ref. Fig. 512, 513)

(1)Prepare thrust reverser system to be moved manually and disconnect main drive flexible shaft.

(a)Prepare thrust reverser system to be moved manually.

1 Pull and retain secondary lock release handle by installing wedges on both left and right master actuators (Ref. Fig. 504, 503).

CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCKED POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER SYSTEM.

2 Manually unlock synchronous shaft lock assembly on both sides (Ref. Fig. 506).

3 Remove 2 bolts and the plate from the unused recess on master and slave actuators.

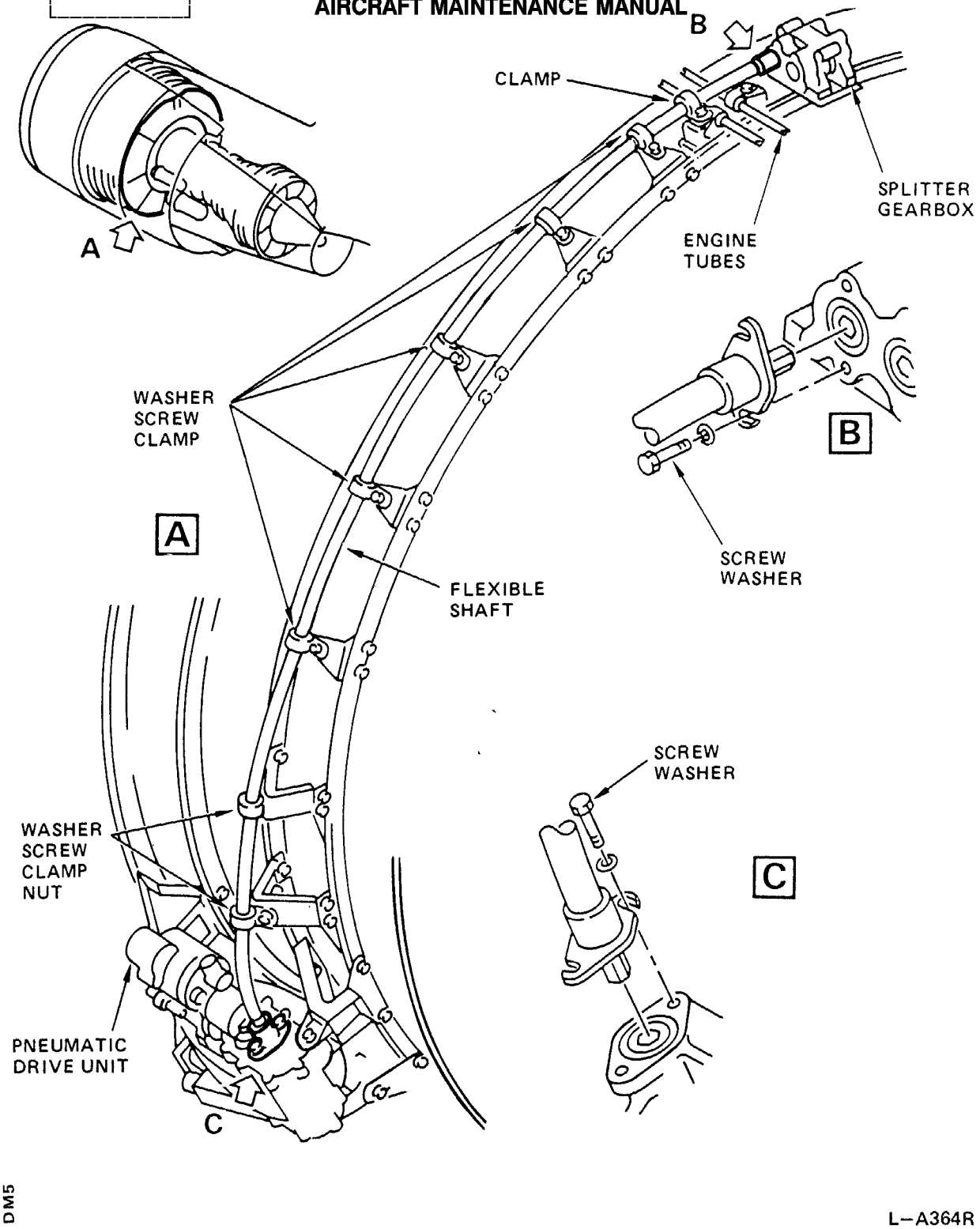
(b)Disconnect main drive flexible shaft from power drive unit (PDU).

1 Remove lockwire, screws, and washers securing lower end of shaft to PDU.

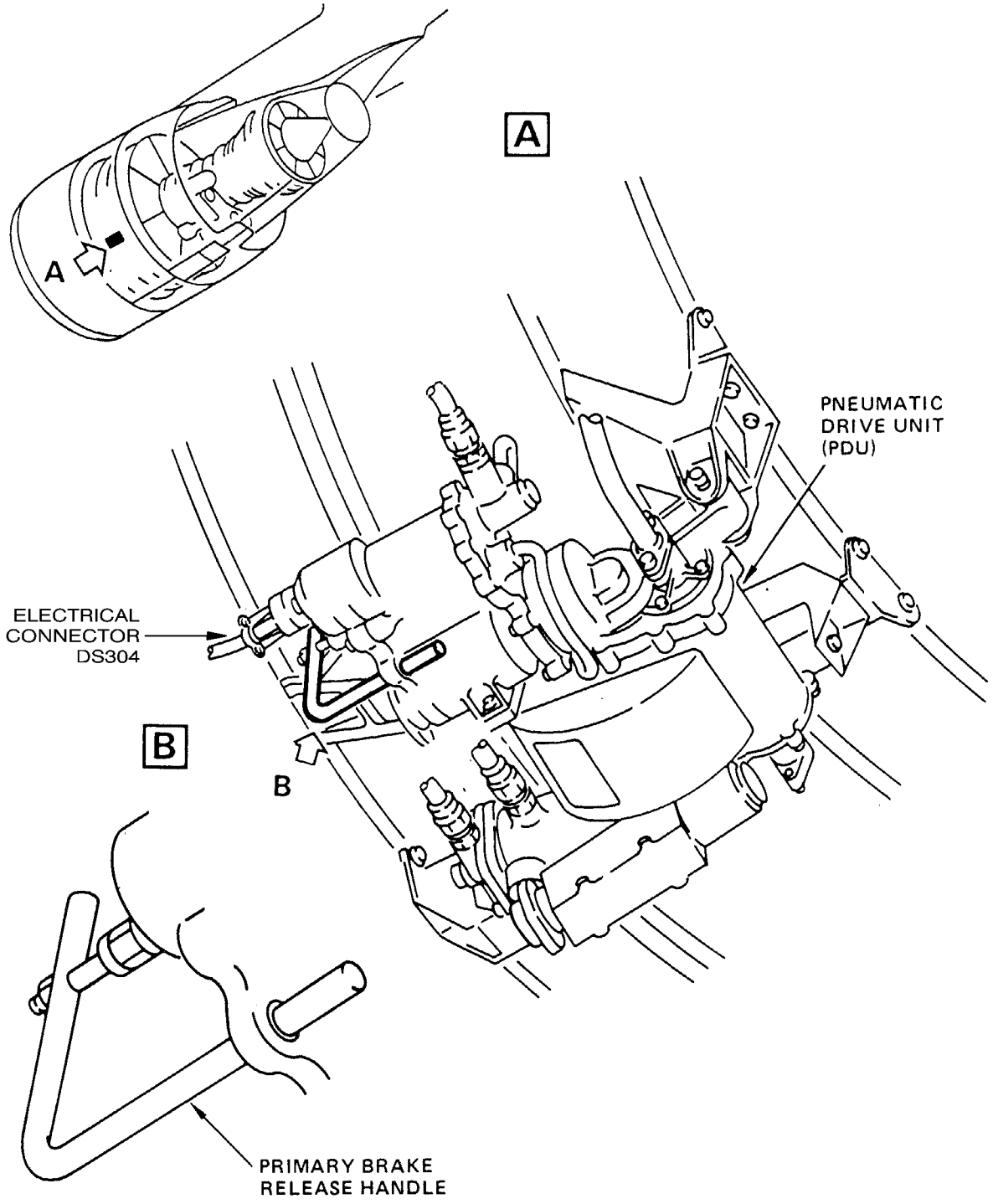
2 Remove bolt and washer securing the lowest clamp on the flexshaft to the bracket.

3 Disconnect flexible shaft from PDU.

4 Tape the end of the flexible shaft to keep the inner core from sliding out.



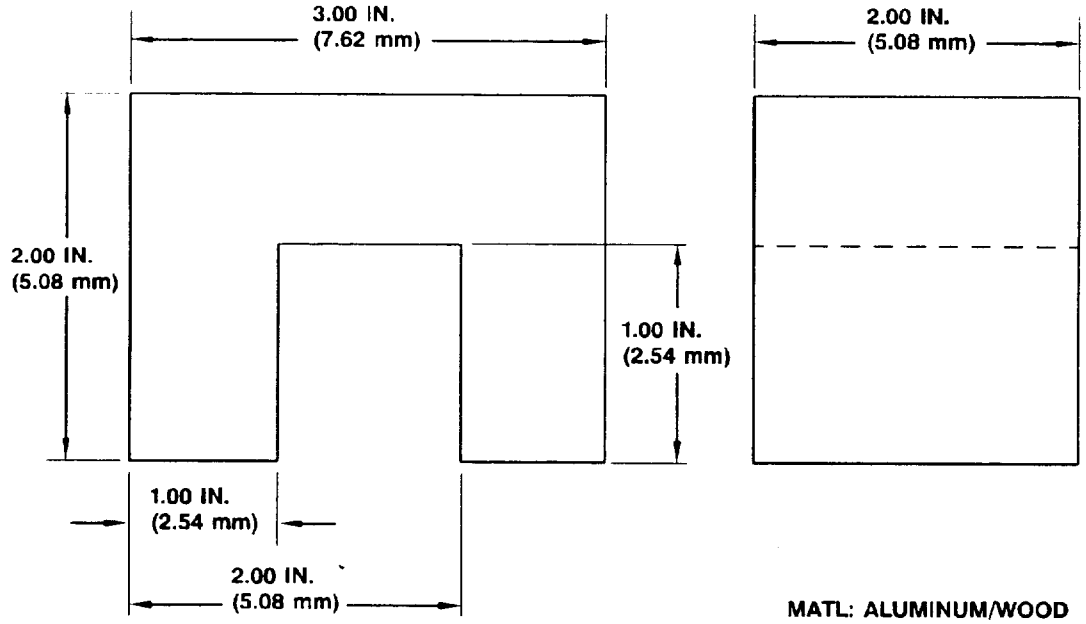
Thrust Reverser Main Drive Flexible Shaft
Figure 501



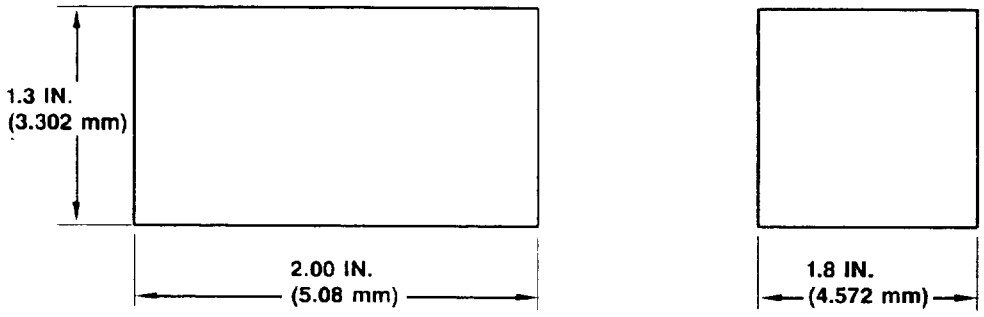
BM5 78 31 00 5 KCM0 01

L-A365R

PDU Primary Brake Release Handle
Figure 502



SECONDARY LOCK WEDGE



PRIMARY LOCK WEDGE

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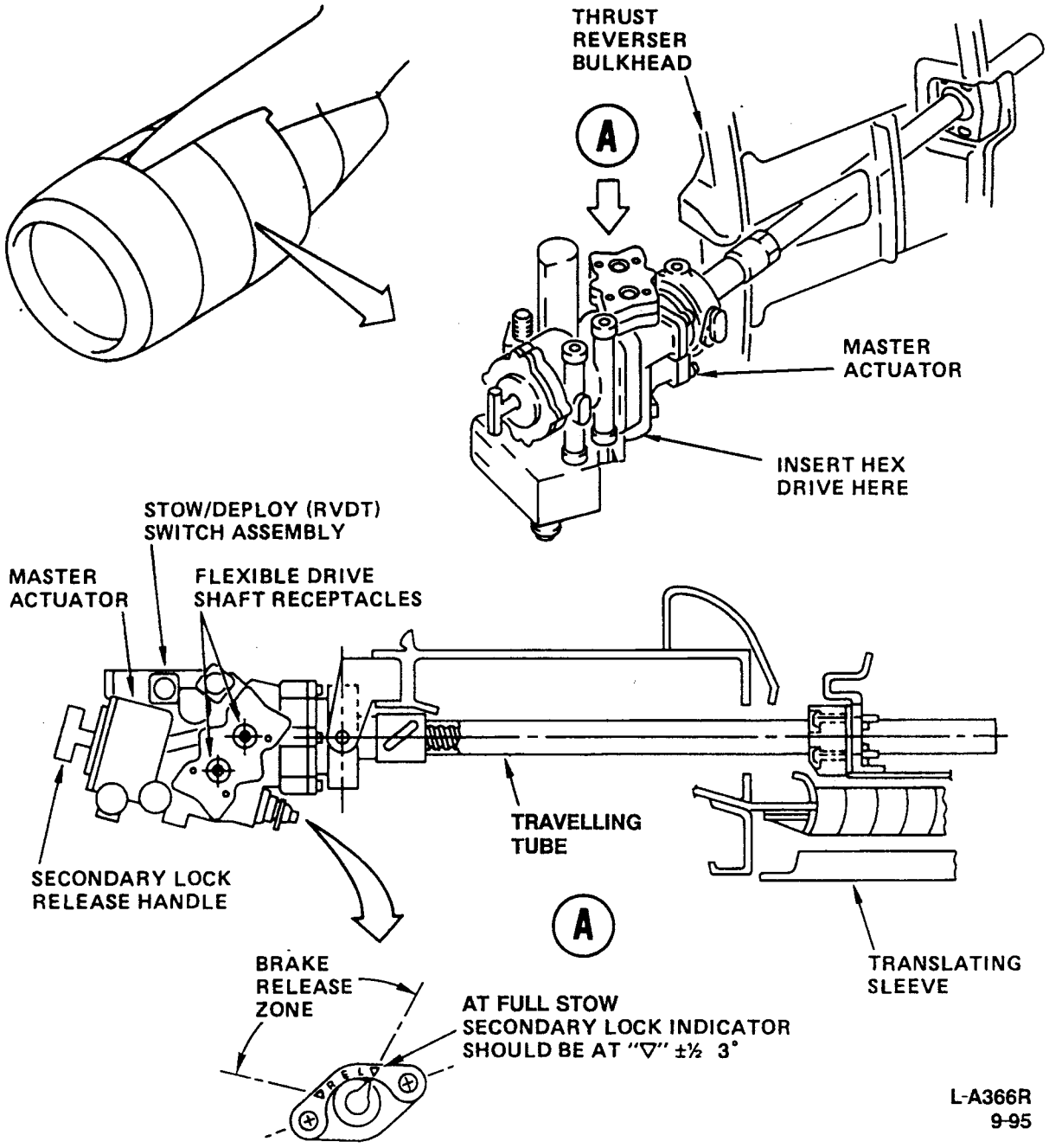
L-A057T(0400)

Lock Wedge Tool Design
Figure 503



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Secondary Lock Release
Figure 504

**ON A/C 101-200,

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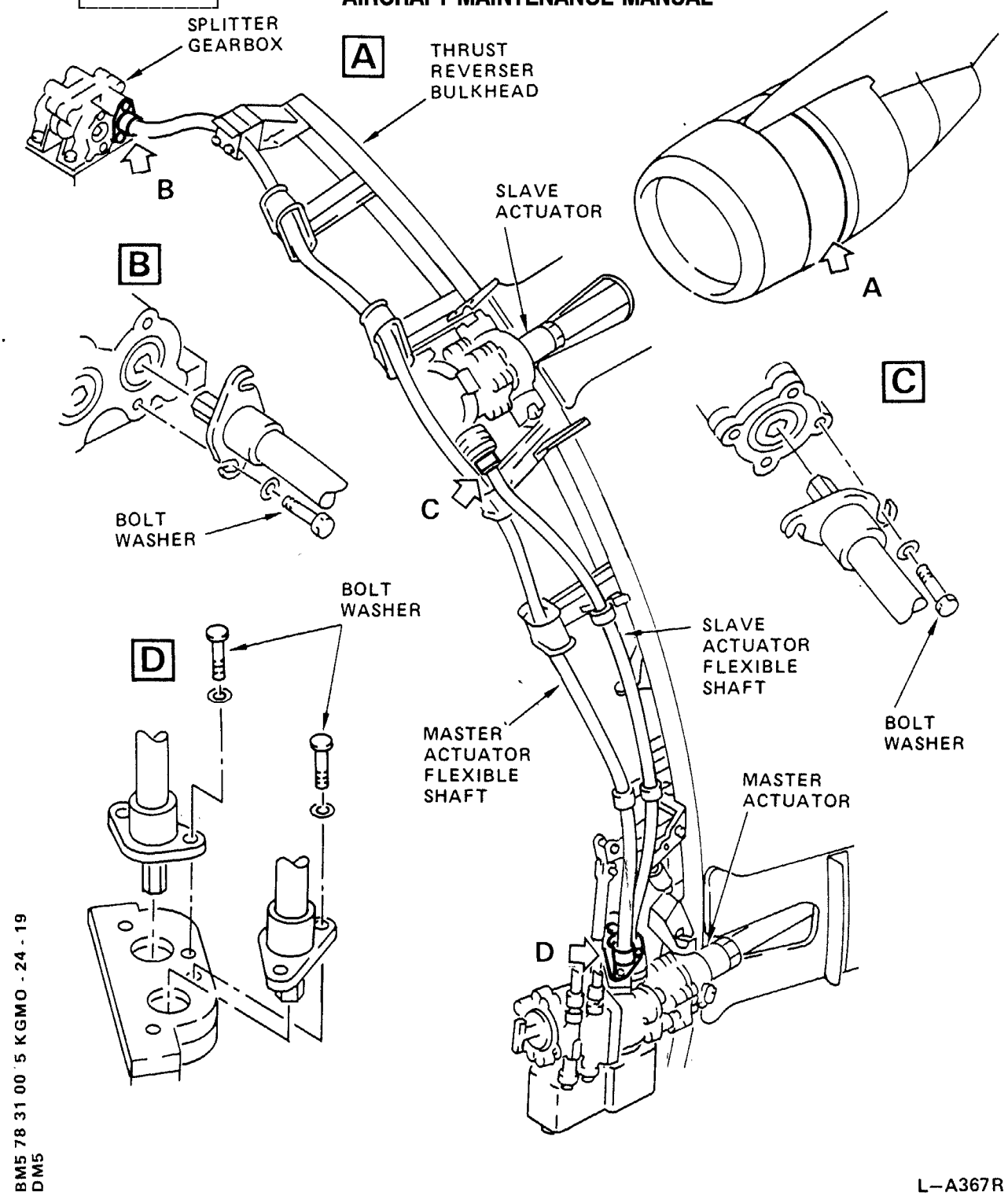
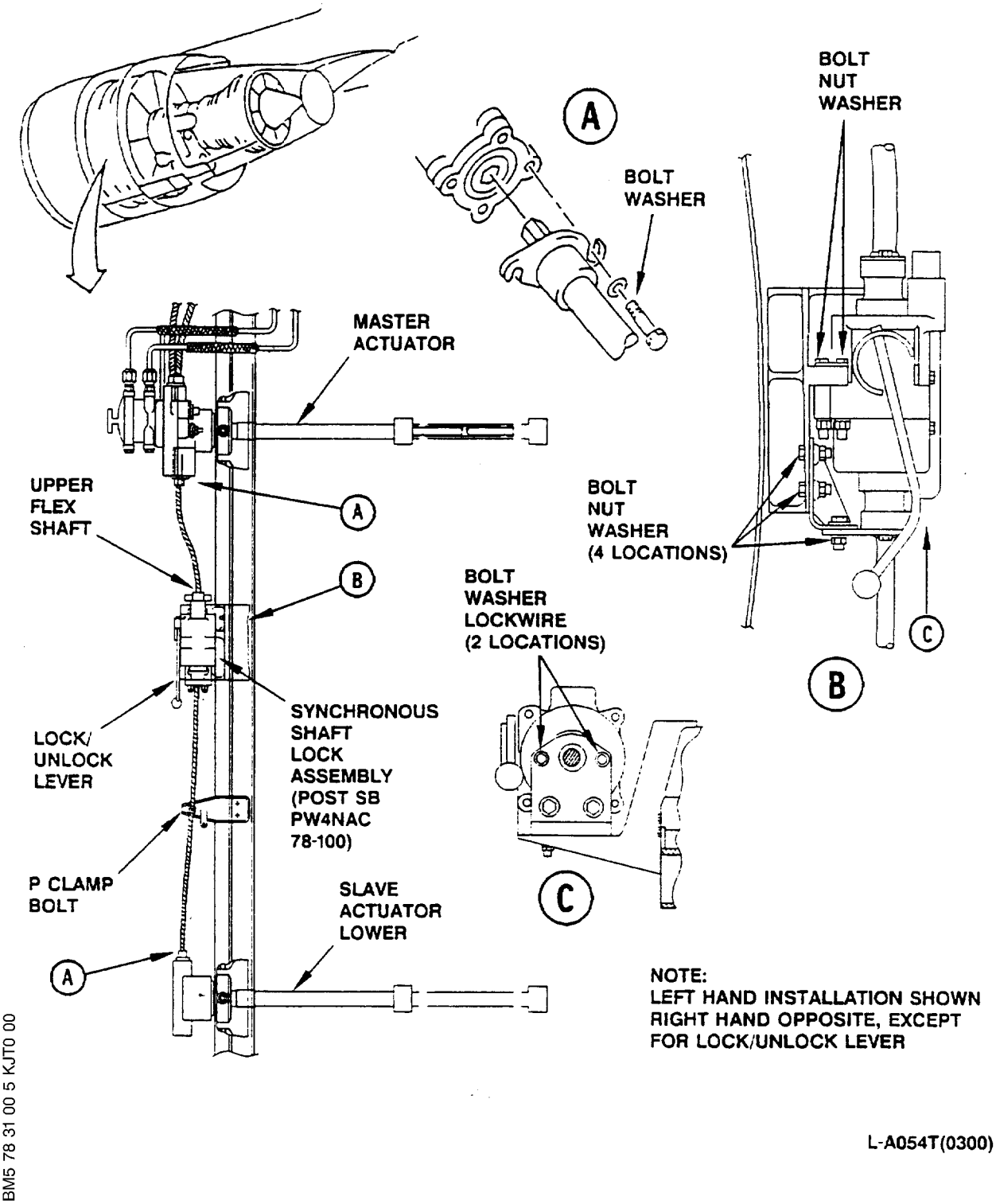
(2)Disconnect master actuator drive flexible shaft (Ref. Fig. 505).
(a)Remove bolts and washers attaching shaft flanges to master actuator on thrust reverser bulkhead.
(b)Remove shaft from actuator drive sockets.
(3)Disconnect upper slave actuator drive flexible shaft.
(a)Remove lockwire, bolts, and washers attaching shaft flange to master actuator.
(b)Remove shaft from master actuator drive socket.
(c)Repeat steps (2) and (3) to check master and upper slave actuators on the opposite side.
(4)Disconnect lower slave actuator drive flexible shaft (Ref. Fig. 506).
(a)Remove lockwire, bolts, and washers attaching shaft flanges to lower slave actuators.
(b)Remove shaft from lower slave actuator drive socket.
(c)Repeat step (4) to check slave actuator on the opposite side.

**ON A/C 101-200,

(5)Synchronize secondary lock
NOTE : The following procedure is necessary only if the travelling tube has been allowed to rotate while the actuator has been extended and the secondary lock indicator is not at the correct full stow position.
NOTE : At full stow there are 13 possible locations of the secondary lock position indicator. (Ref. Fig. 507). The correct full stow position of the indicator is zero.
CAUTION : DO NOT HAND CRANK THROUGH THE PDU. CRANK FROM MASTER ACTUATOR TO MOVE REVERSER. FAILURE TO COMPLY WILL RESULT IN DAMAGE TO THE PDU.
(a)Using a 3/8 inch hex wrench, fully retract master actuator so that it is hard against its stops and hold it in position.
(b)Compare the position of the secondary lock indicator (Ref. Fig. 507). The numbered positions indicate the number of revolutions the travelling tube must be rotated, in the retract direction (counter-clockwise), to synchronize the secondary lock.
CAUTION : IF IT IS NECESSARY TO SYNCHRONIZE THE SECONDARY LOCK, THE RVDT/STOW/DEPLOY SWITCH ASSEMBLY MUST FIRST BE REMOVED FROM THE MASTER ACTUATOR.
(c)Insert hex wrench into the three actuators drives and deploy the reverser sleeve 18 in. (457.2 mm) to gain access to cascades.
CAUTION : IF MORE THAN ONE CASCADE AT A TIME PER THRUST REVERSER HALF IS REMOVED, A GAP CHECK IS REQUIRED BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND AFT CASCADE SUPPORT FRAME AT CASCADE INSTALLATION (REF. 78-32-16, P. BLOCK 401 FOR DETAILED GAP CHECK PROCEDURE).



Master Actuator and Upper Slave Actuator
Figure 505



BM5 78 31 00 5 KJT0 00

Flexible Shaft Master/Lower Slave Actuator
Figure 506

(d)To gain access to the sleeve attach fitting, remove bolts and washers attaching two cascades adjacent to the master actuator. Remove cascades. (Ref. Fig. 508)

(e)Remove the sleeve attach fitting from the translating sleeve.

(f)Looking forward from the end of the traveling tube, rotate the traveling tube counterclockwise the number of revolutions (360 degrees) identified in step (b).

NOTE : The actuator may need to be retracted slightly before the travelling tube can be rotated.

(g)Retract master actuator to full stow. Do not allow travelling tube to rotate.

(h)The secondary lock indicator should be in zero position. If not at zero, repeat step (b), extend actuator 4 or 5 in. (101.6 or 127 mm), then repeat steps (f) and (g).

NOTE : To be acceptable, the lock indicator must line up within the delta as shown in (Ref. Fig. 507).

CAUTION : DO NOT LET THE TRAVELLING TUBE ROTATE OR ACTUATOR WILL BE DE-SYNCHRONIZED.

R (j)Extend actuator to fully deployed position.

R (k)Verify that the position of the chamfer on the actuator attach fitting is on outboard side of travelling tube.

NOTE : If travelling tube was not rotated, the chamfer will be in the correct position.

R (l)Insert original shim pack under actuator attach fitting and attach shim and fitting to translating sleeve with screws. TORQUE screws to between 50 and 70 lbf.in. (0.56 and 0.79 m.daN).

R (m)Align cascades on forward and aft support rings.

CAUTION : MINIMAL GAP REQUIREMENTS BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND THE AFT CASCADE SUPPORT FRAME MUST BE MAINTAINED. REFER TO 78-32-16, P. BLOCK 401 FOR TRANSLATING SLEEVE INNER PANEL TO AFT CASCADE FRAME SHIMMING PROCEDURES.

R (n)Use Material No.P09-013 and wet-install bolts and washers attaching cascades to support ring. TORQUE bolts to between 50 and 70 lbf.in. 0.56 and 0.79 m.daN). For tightening sequence (Ref. Fig. 508).

R (p)Insert hex wrench in all three master actuators and manually drive translating sleeve to fully stowed position.

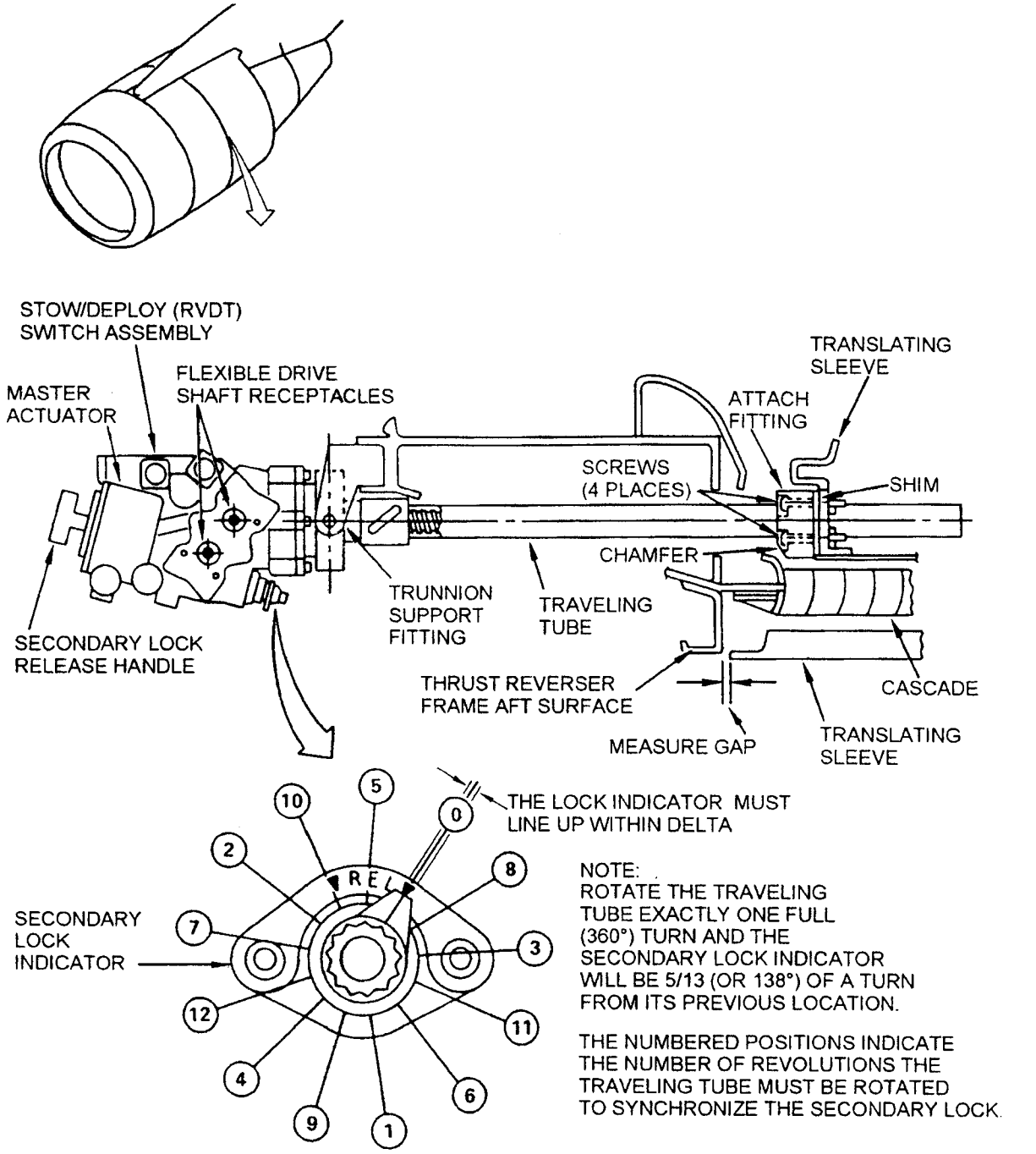
NOTE : If the translating sleeve is not held in place to compensate for the bulb seal compression, the actuator travelling tube will not come to full stow and the REV unlock light could illuminate.

**ON A/C 101-200,

CAUTION : IF THE FORWARD LATCH STRAP ON THE COWL IS UNLOCKED, MAKE SURE THAT IT DOES NOT INTERFERE WITH THE SLAVE ACTUATORS DURING THE FOLLOWING OPERATIONS.

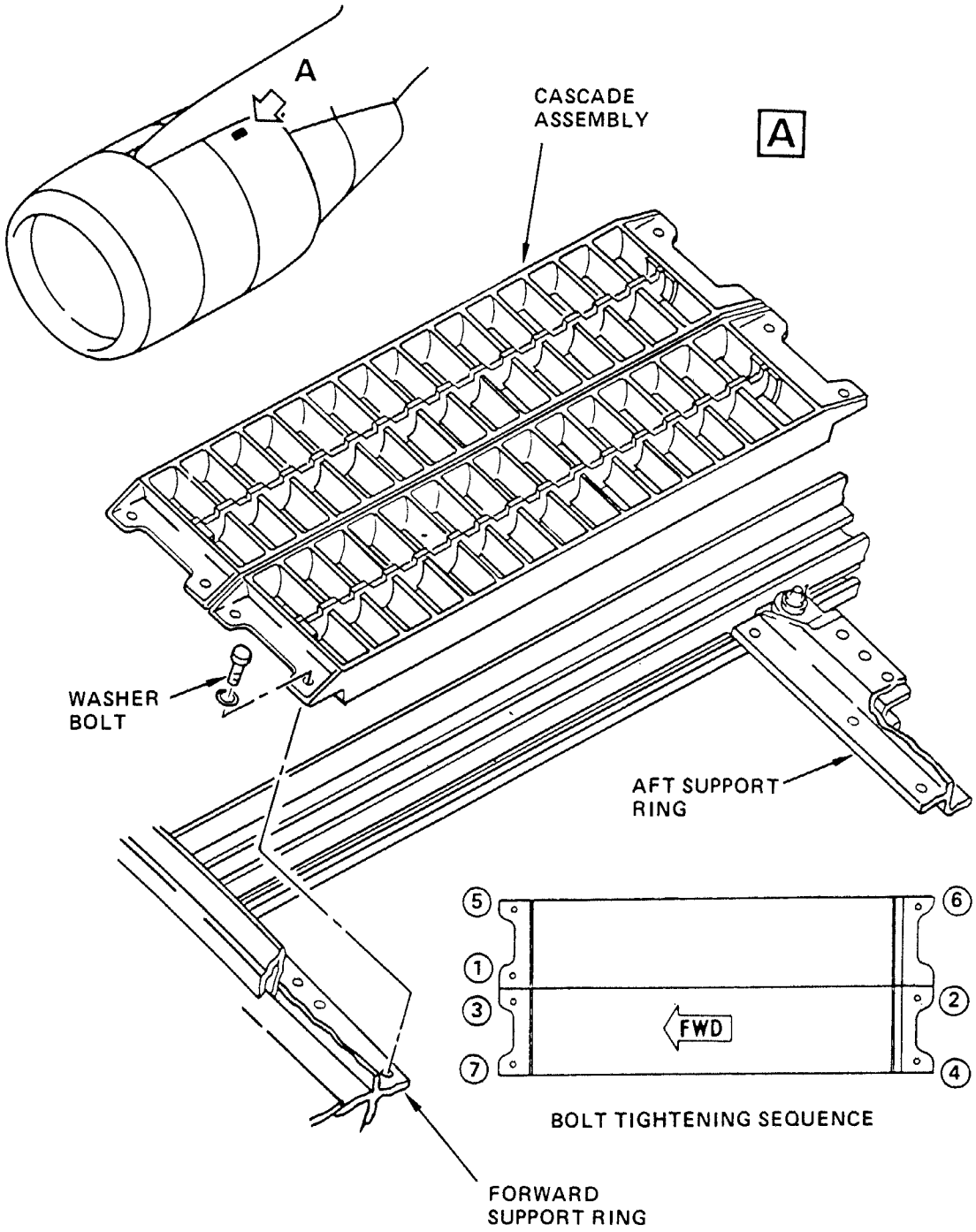
(6)Adjust master and slave actuators.

(a)Install translating sleeve actuator drive flexible shafts



BM5 78 31 00 5 KLM0 02

Actuator Adjustment
Figure 507



BM5 78 31 00 5 KNMO - 24 - 19
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Thrust Reverser Cascade
Figure 508

(Ref. 78-31-12, P. Block 401).

(b)Adjust master and slave actuators sleeve gap (Ref. Fig. 507).

1 With actuators hard on their stops, measure the gap, adjacent to each actuator, between the translating sleeve forward edge and
R thrust reverser frame aft surface. Allowable gap is between 0.09 and
R 0.15 in. (2.3 and 3.8 mm).

NOTE : The allowable gap dimension is different when pneumatic pressure is applied.

CAUTION : IF MORE THAN ONE CASCADE AT A TIME PER THRUST REVERSER HALF IS REMOVED, A GAP CHECK IS REQUIRED BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND AFT CASCADE SUPPORT FRAME AT CASCADE INSTALLATION (REF. 78-32-16, P. BLOCK 401 FOR DETAILED GAP CHECK PROCEDURE).

2 If the required gap is not achieved, remove two cascades adjacent to each actuator and add or remove shims as follows (Ref. Fig. 508).

- Check that secondary lock release handle on the master actuator is pulled.
- Deploy translating sleeve 18 in. (457 mm) to gain access to the cascades and the sleeve attach fitting.
- Remove bolts and washers attaching cascade to thrust reverser and cascade support rings. Remove cascade.
- Remove the actuator sleeve attach fitting from the translating sleeve.
- Adjust thickness of laminated shim between actuator attach fitting and translating sleeve to obtain required gap.
- Attach shim and fitting to translating sleeve with screws. TORQUE screws to between 50 and 70 lbf.in. (0.56 and 0.79 m.daN). Repeat steps (a) and (b).

CAUTION : MINIMAL GAP REQUIREMENTS BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND THE AFT CASCADE SUPPORT FRAME MUST BE MAINTAINED. REFER TO 78-32-16, P. BLOCK 401 FOR TRANSLATING SLEEVE INNER PANEL TO AFT CASCADE FRAME SHIMMING PROCEDURES.

- Align cascade on forward and aft support rings.
- Apply Sealing Compound (Material No.P09-019) to bolts and install bolts and washers attaching cascade to support rings.

3 Repeat steps 1 and 2 for the actuators on the opposite sleeve.

(c)Synchronize the translating sleeves.

NOTE : Complete these steps once all actuators are adjusted and proper gap is achieved at the translating sleeve forward edge.

1 Through each master actuator's open receptacle, retract the sleeves to the fully stowed position, ensuring that the bulb seal is compressed.

2 Insert the flexshafts attached to the splitter gearbox into each of the master actuators. Install bolts and washers. TORQUE the bolts to between 20 and 25 lbf.in. (0.22 and 0.28 m.daN).

**ON A/C 101-200,

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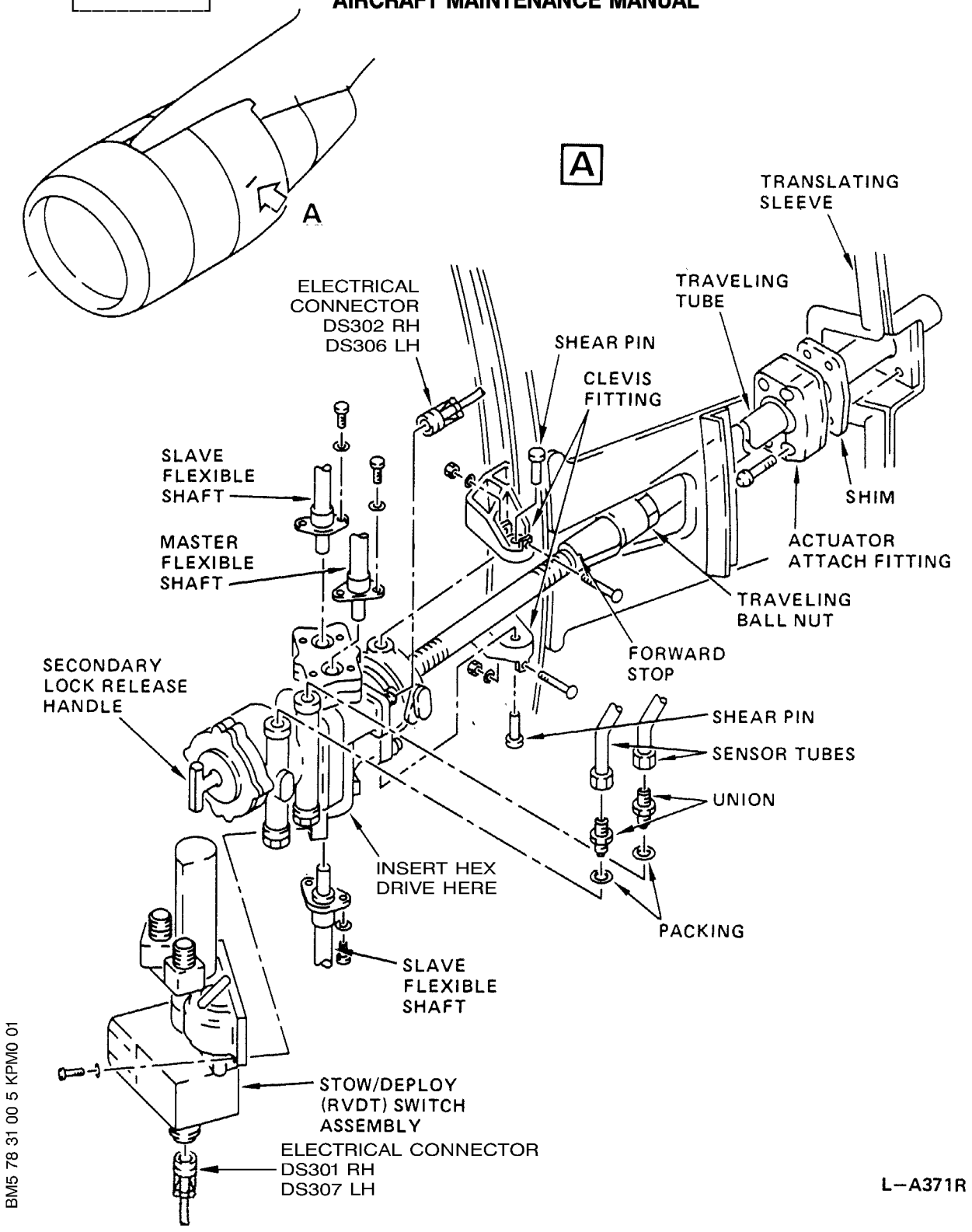


Master Actuator
Figure 509

(7)Verify operation of master actuator secondary lock.

CAUTION : THE FOLLOWING STEPS ARE TO BE DONE ONLY AFTER THE FLEXSHAFTS BETWEEN THE MASTER ACTUATOR AND SPLITTER GEARBOX HAVE BEEN DISCONNECTED PER STEP 3.B.(2) OF THIS PROCEDURE. THIS MUST BE DONE IN ORDER TO MAKE SURE OF THE SUCCESS OF THE FOLLOWING PROCEDURE.

CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCKED POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER SYSTEM.

(a)Stow the translating sleeve and remove wedges used to retain secondary lock release handle. The secondary lock release handle should be retracted and the secondary lock indicator must be at the delta mark (plus or minus 1/2 of the mark).

(b)If the indicator is not in the proper position, the secondary lock must be synchronized.

NOTE : Hex wrench pressure must be applied to make sure that the indicator is in the specified position.

(c)Slowly extend translating sleeve assembly with a socket drive inserted into master actuator and count the number of turns.

(d)After each full turn, pull the secondary lock handle. After two to three turns, handle withdrawal should be mechanically restrained.

(e)Continue the extend operation and check that after nine to ten turns, the secondary lock engages and any further movement in the deploy direction is halted. At this point, the translating sleeve should be extended about 1/2 in. (12.7 mm) from the fully stowed position.

(f)Stow translating sleeve.

NOTE : To assure translating sleeves are at full stow, using a hex-drive wrench to apply pressure to compensate for bulb seal compression to assure actuator travelling tube dog stops are in full contact (Ref. Fig. 510).

(g)Repeat steps (7) from the master actuator on the opposite side.

(8)Final check in flight position.

(a)Pull and retain secondary lock release handle on both master actuators and check that both synchronous shaft locks are released.

(b)With the hex wrench, extend the reverser from the fully stowed position.

(c)Measure torque required to drive sleeve at three positions along the stroke (1, 10, and 20 in.) (25.4, 254 and 508 mm). Check that TORQUE at actuator does not exceed 25 lbf.in. (0.28 m.daN).

(9)Adjust RVDT stow/deploy switch (Ref. Fig. 511).

(a)With the reverser fully stowed, verify that the STOW STOP line on the cam aligns with the scribe line on the cam window. Verify that the limit switch shaft indicator is aligned with the counterclockwise edge of the STOW band, and the RVDT shaft marks are aligned within plus or minus 15 degrees. At the limit switch electrical receptacle (DS301 for the left RVDT or DS307 for the right RVDT), verify that there is no continuity between pins 3 and 4 and between pins 5 and 6. (Ref. Fig. 512).

(b)Verify that there is continuity between pins 7 and 8.

(c)Monitor pins 3 and 4 as the reverser is slowly manually deployed (Ref. 78-32-11, P. Block 201), continuity must be present between pins 3 and 4 at between 3 and 6 revolutions of the input drive.

(d)Continue to drive the reverser to the fully deployed position while monitoring pins 1 and 8 of the limit switch receptacle. Note the point where continuity is made between pins 1 and 8. This must occur between 20 and 37 revolutions of the input drive before the actuator stops at the fully deployed position.

(e)Drive the reverser 7 1/2 revolutions toward the stow position to locate it at the nominal deployed position. Verify that the limit switch shaft visual indicator aligns with the DEPLOY index line. (Ref. Fig. 511)

(f)Slowly drive the reverser from nominal deploy position toward the stow position while monitoring pins 1 and 8. Continuity between pins 1 and 8 must break between 12 and 42 revolutions of the input drive.

(g)Continue to drive the reverser to the fully stowed position while monitoring pins 3 and 4. Continuity between pins 3 and 4 must break between 2 and 6 revolutions of the input drive before the actuator stops at the fully stowed position. With the reverser fully stowed, verify that the STOW STOP line aligns with the visual indicator line.

(h)If all the previous steps do not give the correct results, adjust the RVDT assembly as follows :

1 Remove the RDVT assembly from the master actuator (Ref. 78-31-40, P. Block 401).

CAUTION : DO NOT ROTATE THE INPUT GEAR SUCH THAT THE LIMIT SWITCH SHAFT INDICATOR MOVES CLOCKWISE PAST THE DEPLOY INDEX LINE OR COUNTERCLOCKWISE PAST THE STOW INDEX LINE.

2 Rotate the input gear on the RVDT switch assembly until the STOW STOP line on the cam is aligned with the visual indicator as shown in (Ref. Fig. 511).

3 Verify that the limit switch shaft indicator is aligned with the counterclockwise edge of the stow band and that the RVDT shaft marks are aligned with plus or minus 15 degrees.

NOTE : If it is not possible to get all three marks to line up correctly, it may be necessary to replace the RVDT.

CAUTION : DO NOT ALLOW THE RVDT INPUT GEAR TO ROTATE WHILE THE ASSEMBLY IS BEING HANDLED OR INSTALLED.

4 Hold the master actuator firmly on the stow stops and reinstall the RVDT assembly (Ref. 78-31-40, P. Block 401).

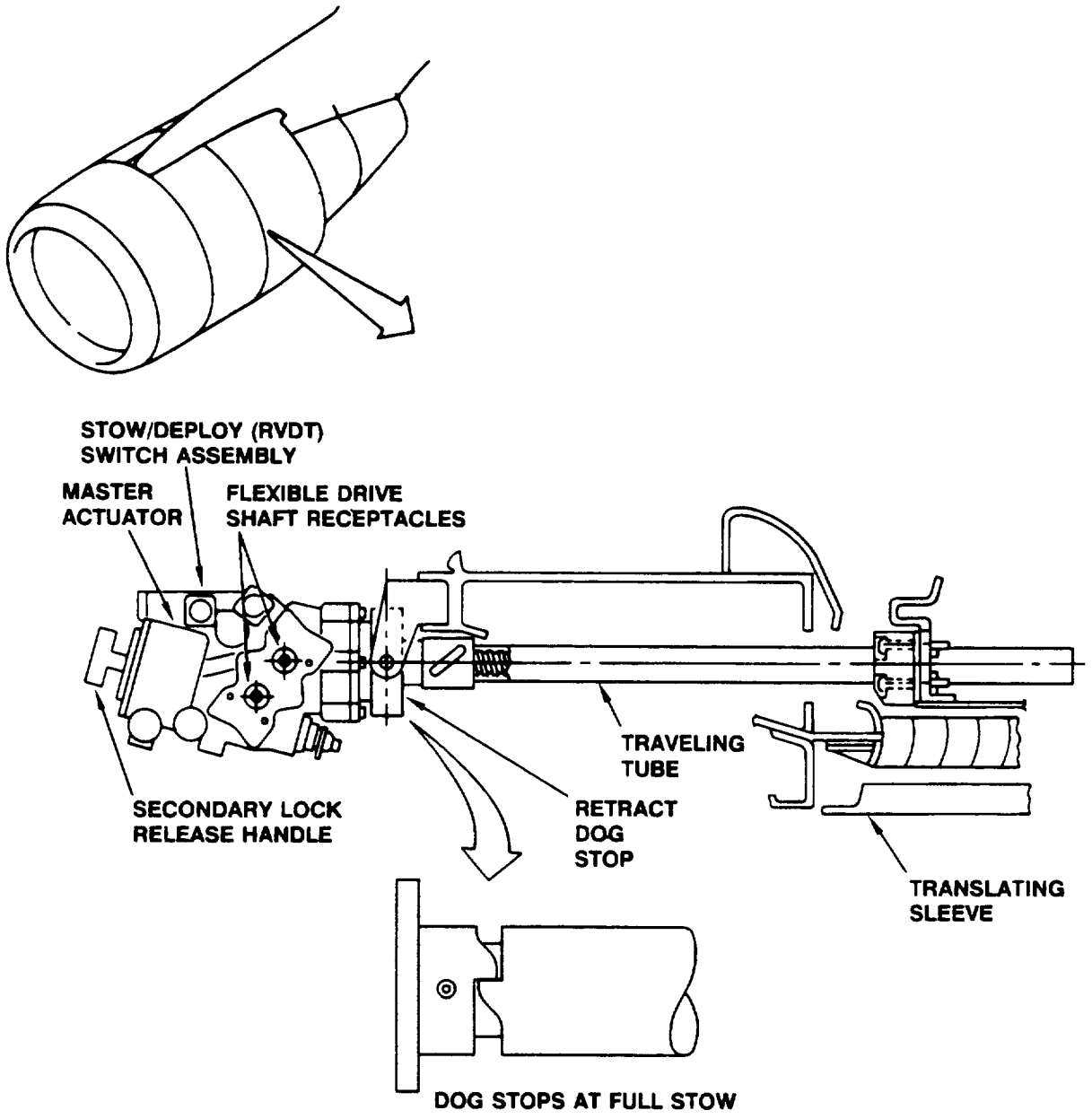
5 Repeat Steps (a) through (g).

CAUTION : MAKE SURE THE RVDT CONNECTORS ARE PROPERLY RE-CONNECTED. A LOOSE OR FREE CONNECTOR CAN CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

R (j)Connect connector (DS307 for left RVDT, DS301 for right RVDT). Tighten connector fingertight plus one-eighth turn.

R (k)Repeat Steps (a) through (i) for RVDT assembly on the opposite side.

**ON A/C 101-200,



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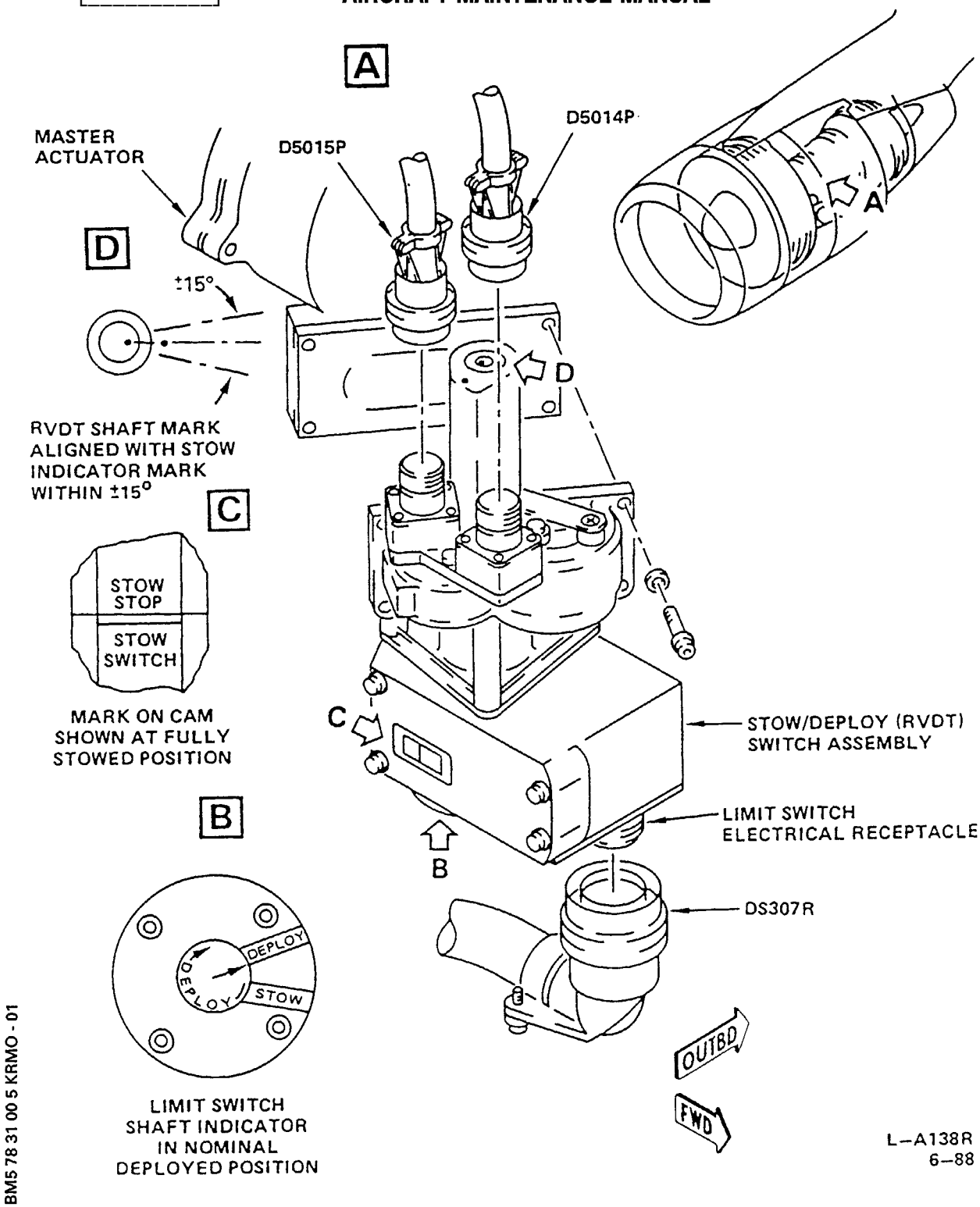
Dog Stop at Full Stow
Figure 510



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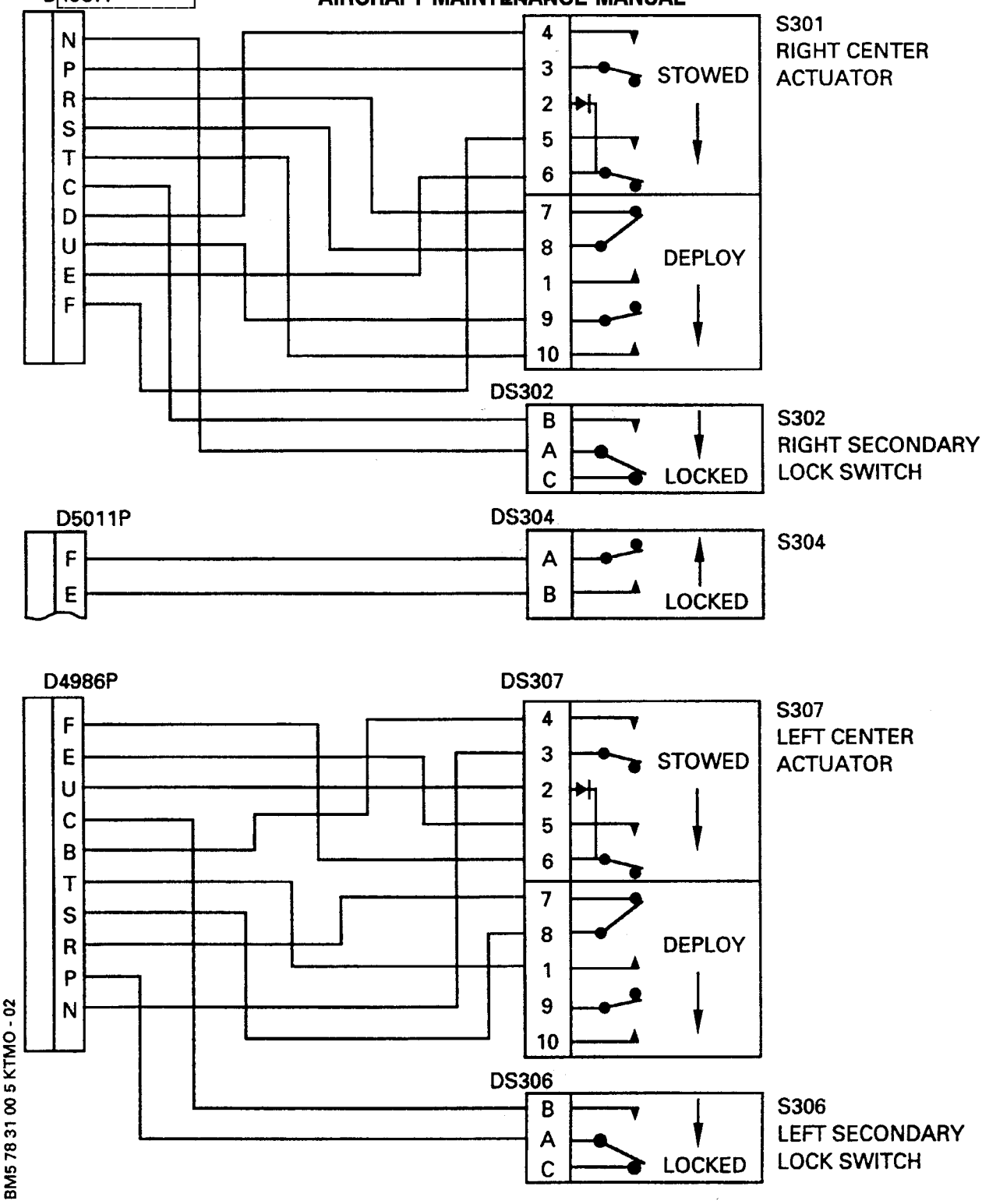
Stow/Deploy RVDT Switch Adjustment
Figure 511



Wiring Diagram - Stowed Position
Figure 512

(10)Adjust pneumatic drive unit
(a)Open IDG/starter access door, remove cover from starter air supply duct coupling, and attach air supply hose (RSE1079) (Ref. Fig. 513).
(b)Pull pin on ground air valve and move handle to closed position. While holding spring loaded handle in closed position, remove cover from ground air valve port and attach air supply hose to valve port.
CAUTION : MAKE SURE THE DRIVE CABLE IS DISCONNECTED PER STEP (1) PRIOR TO PRESSURIZING THE PDU. FAILURE TO DO THIS MAY RESULT IN SUDDEN THRUST REVERSER MOVEMENTS AND POSSIBLE INJURY TO PERSONNEL.
(c)Pressurize pneumatic drive unit by applying inlet pressure of 34 - 38 psig (2.34 - 2.62 bars). Energize the selector valve deploy solenoid and the pressure regulating and shutoff valve using a 28VDC electrical power source. The pneumatic drive unit will rotate to a position correlated to the actuator full deploy position less 7-1/2 turns. The brake will automatically be applied.
(d)Remove pneumatic pressure.
(e)Remove air supply hose from starter air duct coupling and ground air valve. Install covers and open ground air valve.
(f)Close IDG/starter access door.
(11)Adjust main drive flexible shaft.
CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCKED POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER SYSTEM.
(a)Make sure that the primary brake on the pneumatic drive unit is "ON" and the brake handle is "IN" and check that both synchronous shaft lock handles are in unlocked position.
(b)Insert hex wrench in the lower available hex of each master actuator and manually stow the translating sleeves.
NOTE : If the translating sleeve is not held in place to compensate for the bulb seal compression, the actuator travelling tube will not come to full stow and the REV unlock light could illuminate.
(c)With the sleeves held in the fully stowed position, install the flexible shafts, which lead from the splitter gearbox, to the master actuator with screws and washers. TORQUE screws to between 20 and 25 lbf.in. (0.22 and 0.28 m.daN).
NOTE : Do not attach main drive flexible shaft to the pneumatic drive unit.
(d)Release secondary lock on master actuators and hold in unlock position. Make certain that handle of synchronous shaft lock assembly is in unlock position.
(e)Driving through the unused hex of one master actuator, extend the translating sleeves to the nominal deploy position (extend to full deploy, then retract 7 1/2 turns).
(f)Hold this position at the master actuator to prevent sleeve from drifting and install main drive flexible shaft in pneumatic drive unit with screws and washers in shaft mounting plates. TORQUE screws to between 20 and 25 lbf.in. (0.22 and 0.28 m.daN).
NOTE : The cable torque may be preloaded as much as one drive shaft

hex flat rotation (1/6 turn) if necessary to allow hex engagement at the pneumatic drive unit. The preloading will tend to move the sleeve in the stow direction.

(g)Pull handle and release pneumatic drive unit brake.

(h)Return translating sleeves to full stow position.

**ON A/C 101-200,

(12)Check electrical system (Ref. Fig. 512)

WARNING : MAKE SURE AIR SUPPLIES ARE DISCONNECTED FROM THE THRUST REVERSER DURING THE FOLLOWING CHECKS. FAILURE TO DO THIS MAY RESULT IN SUDDEN THRUST REVERSER MOVEMENTS CAUSING POSSIBLE INJURY TO PERSONEL.

(a)Pneumatic drive unit, regulating and selector valve

1 Check continuity through receptacle D5011P at thrust reverser junction box on right fan case.

Pins B & C	Closed circuit (continuity)
Pins C & G	Closed circuit (continuity)
Pins A & D	Closed circuit (continuity)

2 Pull the pneumatic drive unit brake handle.

Pins F & E	Closed circuit (continuity)

3 Release the pneumatic drive unit brake handle.

Pins F & E	Open circuit (no continuity)

(b)Left hand reverser

1 Check continuity through receptacle D4986P on upper left fan case.

2 Make sure primary and secondary locks are released. With hex drive still in master actuator, return translating sleeves to full stow position.

Pins B & N	Open circuit (no continuity)
Pins E & F	Open circuit (no continuity)
Pins R & S	Closed circuit (continuity)
Pins S & T	Open circuit (no continuity)

3 Drive sleeve to the nominal deploy position.
This is 7-1/2 turns of the drive shaft, in the stow direction, from the full deployed position.

Pins B & N	Closed circuit (continuity)
Pins E & F	Closed circuit (continuity)
Pins R & S	Open circuit (no continuity)
Pins S & T	Closed circuit (continuity)

4 Withdraw the master actuator secondary lock handle and check continuity.

Pins C & P	Closed circuit (continuity)

5 Release the secondary lock handle and check continuity.

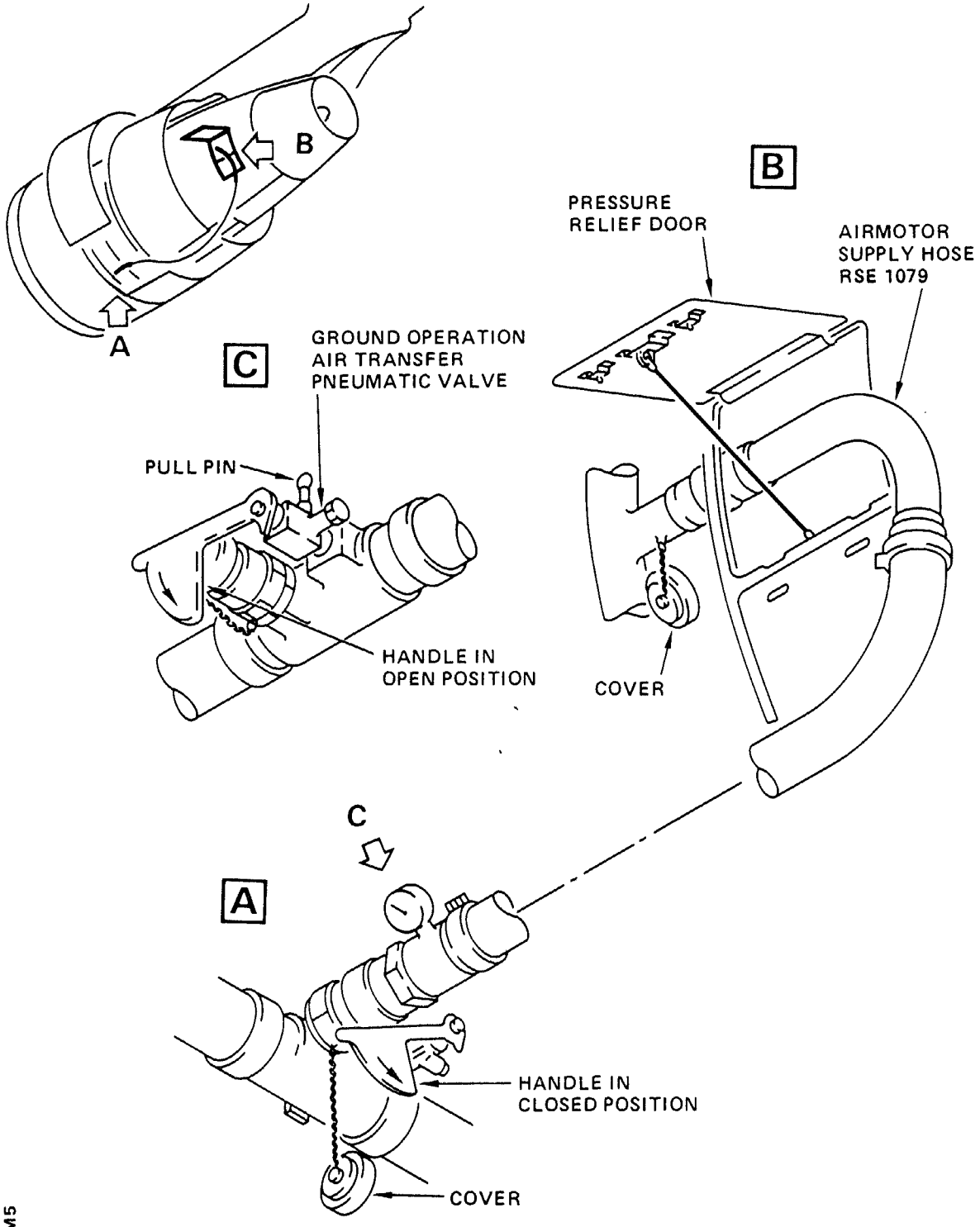
Pins C & P	Open circuit (no continuity)

(c)Right hand reverser

1 Check continuity through receptacle D4987P on upper right fan case.

2 Make sure primary and secondary locks are released. Return translating sleeves to full stowed position.

Pins D & P	Open circuit (no continuity)
Pins F & E	Open circuit (no continuity)
Pins R & S	Closed circuit (continuity)



Pneumatic Drive Unit Adjustment
Figure 513

Pins U & T Open circuit (no continuity)

3 Drive sleeve to the nominal deploy position. This is 7-1/2 turns of the drive shaft, in the stow direction, from the full deployed position.

Pins D & P Closed circuit (continuity)
Pins F & E Closed circuit (continuity)
Pins R & S Open circuit (no continuity)
Pins U & T Closed circuit (continuity)

4 Withdraw the master actuator secondary lock handle and check continuity.

Pins C & N Closed circuit (continuity)

5 Release the secondary lock handle and check continuity.

Pins C & N Open circuit (no continuity)

**ON A/C 101-200,

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(13)Make final system check out.

CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCKED POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER SYSTEM.

(a)Pull and retain primary brake release handle and check that lever of synchronous shaft lock is placed in unlocked position. Return translating sleeves to full stow position. Remove hex wrench from actuator.

NOTE : To assure translating sleeves are at full stow, using a hex-drive wrench to apply pressure to compensate for bulb seal compression to assure actuator travelling tube dog stops are in full contact (Ref. Fig. 510).

(b)Set all controls at STOW.

1 Close C/B's 1KM, 2KM, 3KM, 4KM.
2 Check that both thrust reverser control levers are in forward idle position.
3 Remove wedge and release PDU brake handle.
4 Check secondary lock handle on both master actuators is retracted.
5 Put manual unlock lever of both synchronous shaft locks in normal position.

(c)Attach an air supply to the ground air supply valve and increase available pressure to 20 psig (1.38 bar).

(d)Move the thrust reverser control lever to reverse idle position.

(e)At full deploy position check that the pneumatic drive unit brake has engaged (handle retracted) and that the secondary lock handle is extended.

NOTE : In the deploy position, the system will remain electrically and pneumatically energized.

(f)Check that the REV light is illuminated (Ref. Fig. 514).

(g)Disconnect the air supply to the ground air supply valve.

CAUTION : FAILURE TO RE-RIG THE PDU AND DRIVE CABLES IF THE RIGGING CHECK

IS NOT BETWEEN 7 TO 8 TURNS MAY CAUSE A SHORTENED LIFE EXPECTANCY OF THE THRUST REVERSER ACTUATION SYSTEM COMPONENTS.

(h)Pull and retain primary brake release handle on PDU and pull and retain secondary lock release handle on both master actuators. Insert a 3/8 inch (965.2 mm) hex wrench in the right (left) master actuator hex drive and turn wrench clockwise (counterclockwise) to slowly deploy the reverser while counting turns. The reverser should stop at 7 to 8 turns. If the number of turns is less than 7 or more than 8 turns, repeat Steps 10 and 11.

R (j)Remove wedge and release PDU brake handle and both secondary lock release handles.

R (k)Connect the air supply to the ground air supply valve.

R (l)Move the thrust reverser control lever to forward idle position.

NOTE : When the translating sleeves are fully stowed, the system will automatically shut down. This is because of the current breaking action of the stow switches. The stow switches play a dual role in that they provide a signal to the flight compartment and also shut down the pneumatic drive unit following stow.

R (m)Check the following :

1 Indicator lights are extinguished. The system has shut down electrically.

2 The pneumatic drive unit brake and master actuator secondary lock handles have withdrawn.

3 The translating sleeve is fully stowed and the gap at the forward edge of the sleeve is between 0.09 and 0.21 in. (2.3 and 5.33 mm).

NOTE : A red warning band, on the structure, will be visible if the sleeves are not fully stowed.

R (n)Install plate on recess with screw. TORQUE screws to between 20 and 25 lbf.in. (0.22 and 0.28 m.daN).

C. Close-Up

(1)Make certain that working area is clean and clear of miscellaneous items of equipment.

(2)Close fan cowl doors (Ref. 71-13-00, P. Block 301).

(3)Test engine per Operational Test (Ref. 78-32-11, P. Block 501) or if required per thrust reverser functional and Indication/Warning Sensors test (Ref. Para. 5.).

**ON A/C 101-200,

4. Landing Gear Ground Function Test

A. Job Set-Up

(1)Make certain that the following circuit breakers are closed : 1KM, 2KM, 3KM, 4KM, 44KM and 45KM.

(2)Make certain that thrust reverser cowl doors are closed.

(3)Open right fan cowl doors (Ref. 71-13-00, P. Block 301).

(4)Remove pneumatic starter duct connection cap and install air motor ground air supply hose (Ref. Fig. 513).
(5)On ground operation air transfer pneumatic valve, pull out lockpin and place valve in closed position using handle.
(6)Release lockpin to lock valve in closed position.
(7)Remove valve port cap.
(8)Remove ground operation air transfer pneumatic valve cap and install AIR Motor Ground Air Supply hose (Ref. Fig. 513).
(9)Pressurize the aircraft
- using HP ground pneumatic source
. connect HP ground air supply unit to HP ground connector
NOTE : To carry out this procedure and to test the ENG2 only open the crossfeed valve as follows :
On AIR BLEED panel 436VU
- release X FEED mode pushbutton switch (MAN legend on)
- press X FEED valve position pushbutton switch (flowbar in line).
- using APU
. start up APU (Ref. 49-00-00, P. Block 501).
On AIR BLEED panel 436VU
- place APU BLEED switch in ON position
(flowbar on APU BLEED annunciator comes on)
- check that X FEED valve position pushbutton switch flowbar is in line.
CAUTION : MAKE CERTAIN THAT INLET PRESSURE IS ABOVE 25PSIG TO FULLY ENERGIZE THE SYSTEM.
(10)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(11)Make certain that electronics racks ventilation is correct.
WARNING : BEFORE CARRYING OUT ANY WORK ON THE FAN REVERSER SYSTEM, OR WHEN PERFORMING THE FAN REVERSER FUNCTIONAL TEST, MAKE CERTAIN THAT THE AREA IS CLEAR OF PERSONNEL BEFORE CONNECTING OR DISCONNECTING THE APU OR PNEUMATIC GROUND POWER UNIT, TO THE THRUST REVERSER GROUND TEST CONNECTION, TO PREVENT DEATH OR SERIOUS INJURY TO PERSONNEL.
CAUTION : BEFORE CONNECTING APU OR PNEUMATIC GROUND POWER UNIT TO THRUST REVERSER GROUND TEST POINT, MAKE CERTAIN THE AREA AROUND THE TRANSLATING SLEEVES ARE CLEAR TO DEPLOY.

**ON A/C 101-200,

B. Test

ACTION	RESULT
1. Check landing gear ground function. - On 133VU, open circuit breaker 1GB. - Move thrust control lever to idle position. - Move thrust reverser control lever to idle position.	Check that : - Translating sleeves remain in stowed position. - REV UNLK warning lights remain off.

ACTION	RESULT
- On 133VU, close circuit breaker 1GB.	Check that : - REV UNLK warning lights come on and translating sleeves move from stowed position.
2. Move thrust reverser control lever to reverser stowed position.	Check that : - REV UNLK warning light goes off when translating sleeves reach the fully stowed position.

C. Close-Up

(1)Depressurize aircraft systems and disconnect pneumatic ground power unit.
(2)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(3)Disconnect thrust reverser air motor supply hose and cap duct outlet. On ground operation air transfer pneumatic valve, cap valve port pull out lockpin and place valve in open position using handle. Release lockpin to lock valve in open position.
(4)Disconnect pneumatic duct supply hose and cap starter duct outlet.
(5)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(6)Close fan cowl doors (Ref. 71-13-00, P. Block 301).
(7)Make certain that throttle control lever is in IDLE position.

5. Thrust Reverser Functional and Indication/Warning Sensors Test

A. Job Set-Up
(1)Make certain that circuit breakers 1KM and 3KM (For ENG1), 2KM and 4KM (For ENG2) are closed.
(2)Make certain that thrust reverser cowl doors are closed.
(3)Open the fan cowl doors (Ref. 71-13-00, P. Block 301).
WARNING : GROUND AIR SUPPLY HOSE MUST BE DISCONNECTED FROM THRUST REVERSER. FAILURE TO DO THIS COULD RESULT IN SUDDEN REVERSER MOVEMENTS WITH POSSIBLE INJURY TO PERSONNEL.
(4)Make certain that no pneumatic ground power unit is connected.
(5)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(6)Make certain that electronics racks ventilation is correct.

B. Perform Functional Test

**ON A/C 101-200,

R

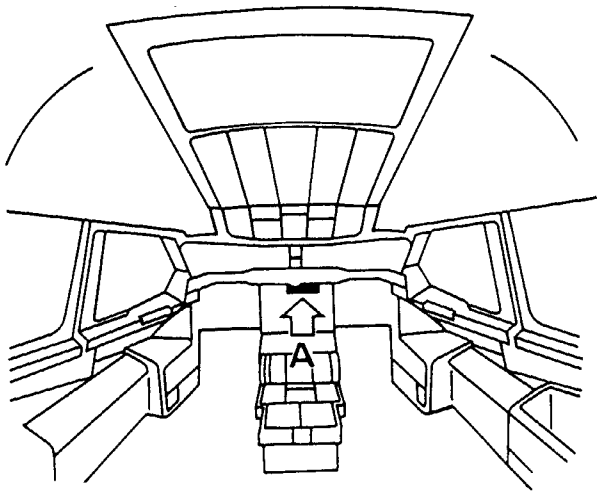
(1)Pull and retain the primary brake release handle (Ref. Fig. 502).

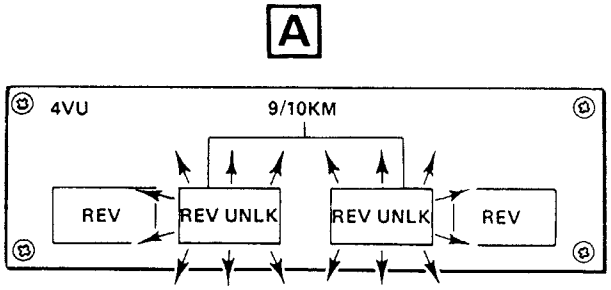
(2)Pull and retain the secondary lock release handle (Ref. Fig. 509).
(3)Put the manual unlock lever of both synchronous shaft locks in unlocked position.
(4)Disconnect plugs DS301, DS302, DS304 and DS306 (Ref. Fig. 502, 509).
(5)Check of the LH translating sleeve stow switch circuit :
(a)Insert a hex wrench into the unused master actuator recess.
(b)Manually drive the translating sleeves about 1 in. (25.4 mm) from the full stow position and check that the REV UNLK light comes on in flight compartment (Ref. Fig. 514).
(c)Manually drive the sleeves to stow up to the full stow position and check that the REV UNLK light goes off.
(6)Reconnect plug DS301 and disconnect plug DS307 (Ref. Fig. 509).
(7)Repeat step (4) to check the RH translating sleeve stow switch circuit.
(8)Reconnect plugs DS307, DS302, DS304 and DS306.
(9)Test the primary brake switch :
(a)On PDU, pull the primary brake release handle and check that the REV UNLK lights come on.
(b)Release the primary brake release handle and check that the REV UNLK lights go off.
(10)Test the secondary lock switches :
(a)On left actuator, pull primary lock handle and check that the REV UNLK light comes on.
(b)Release the primary lock handle and check that the REV UNLK light goes off.
(c)On right actuator, pull primary lock handle and check that the REV UNLK light comes on.
(d)Release the primary lock handle and check that the REV UNLK light goes off.

**ON A/C 101-200,

R

C. Close-Up
(1)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Return the manual unlock lever of both synchronous shaft locks to normal position.
(3)Close fan cowl doors (Ref. 71-13-00, P. Block 301).





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Engine Thrust Reverser Control and Indication
Figure 514

**ON A/C 101-200,

6. Operational Check of the Electric Synchronous Shaft Lock

NOTE : This test is performed with engine not running.

A. Equipment and Materials

ITEM	DESIGNATION
A.	Voltmeter (28VDC)
Referenced Procedures	
- 24-41-00, P. Block 301	AC External Power Control
- 32-00-00, P. Block 501	Landing Gear - General
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

B. Job Set-Up

(1)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(2)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).

**ON A/C 101-200,

(3)Make certain that the following circuit breakers are closed :

	PANEL	SERVICE	IDENT.	LOCATION
R	133VU	HYDRAULIC/L/G PROX DET/& RELAYS SYS2/FLT/GND	1GB	331/V52
R	133VU	HYDRAULIC/L/G PROX DET/& RELAYS SYS1/RELAYS & RETRACT/CTL	2GB	332/U51
R	133VU	HYDRAULIC/L/G PROX DET/& RELAYS SYS1/FLT/GND	119GB	332/U52
R		FOR ENGINE 1		
	133VU	ENGINES/ENG1/REVERSE/CTL	1KM	332/U69
	133VU	ENGINES/ENG1/THRUST REVERSER LOCK	45KM	332/U67
R		FOR ENGINE 2		
	133VU	ENGINES/ENG2/REVERSE/CTL	2KM	331/V74
	133VU	ENGINES/ENG2/THRUST REVERSER LOCK	44KM	331/V75

**ON A/C 101-200,

(4)Check that throttle control levers and thrust reverser control levers are in forward idle position.

C. Test of Engine 1 Synchronous Shaft Locks

ACTION	RESULT
1. Disconnect connectors DH9, DH15, DH16 and DH17.	Check for voltage at pin C of DH15 and for no voltage at all other pins of the disconnected connectors.
WARNING : PRIOR TO OPENING CIRCUIT BREAKER 119GB, TAKE THE APPROPRIATE SAFETY PRECAUTIONS (Ref. 32-00-00, P. Block 501).	
2. Open circuit breakers 1GB, 2GB, and 119GB.	Check for voltage at pin C of DH15 and for no voltage at all other pins of the disconnected connectors.
3. Slowly move the throttle control lever to full forward stop position and permanently monitor the voltage at pin C of DH15.	Check that voltage does not change.
4. Slowly move the throttle control lever to idle forward stop position and permanently monitor the voltage at pin C of DH15.	Check that voltage does not change.
5. Move thrust reverser control lever of engine 1 to reverse idle position and throttle control lever of engine 2 to full forward position.	Check for no voltage at pins of all the disconnected connectors.
6. Close circuit breaker 1GB.	Check for voltage at pin A of DH15 and for no voltage at all other pins of the disconnected connectors.
7. Close circuit breakers 2GB and 119GB.	Check for voltage at pin A of DH15 and at pins 4 of DH16 and DH17 and check for no voltage at pins of DH9.
8. Move throttle control lever of engine 2 to idle position.	Check for voltage at pin A of DH9, pin A of DH15 and pins 4 of DH16 and DH17.
9. Open circuit breaker 45KM (44KM for engine 2).	Check for no voltage at pin A of DH9 and at pins 4 of DH16 and DH17.
10.Close circuit breaker 45KM (44KM) and move thrust reverser control lever of engine 1 to	Check for voltage at pins 4 of DH16 and DH17 for approximately 10s. Check for voltage at pin C of DH15.

ACTION	RESULT
forward idle (stow) position.	Check for no voltage at pin A of DH15. And check for no voltage at pin A of DH9.

D. Test of Engine 2 Synchronous Shaft Locks.
(1)Repeat step C. Use thrust reverser control lever of engine 2 instead of engine 1, throttle control lever of engine 1 instead of engine 2 and 44KM instead of 45KM.

E. Close-Up
(1)Connect connectors DH9, DH15, DH16, DH17.
(2)Close fan cowl doors (Ref. 71-13-00, P. Block 301).
(3)Make certain that all circuit breakers previously opened for test are closed.
(4)Restore aircraft to ground configuration (Ref. 32-00-00, P. Block 501).
(5)Perform an operational test of thrust reverser translating sleeves (Ref. 78-32-11, P. Block 501).
(6)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(7)Make certain that throttle control lever is in forward idle position.

**ON A/C 101-200,

7. Functional Check of the Synchronizing Shaft Lock

A. Equipment and Materials

ITEM	DESIGNATION
Referenced Procedure - 78-30-00, P. Block 201	Thrust Reverser

B. Do Operational Check of the Electric Synchronous Shaft Lock (Ref. Para. 6.).

C. Check Synchronous Shaft Lock System Integrity (Ref. 78-30-00, P. Block 201).

8. Thrust Reverser Cycling Test (Engine Running)
WARNING : MAKE SURE THAT:
- THE TRAVEL RANGES OF THE THRUST REVERSERS OF THE ENGINE ARE CLEAR OF ALL TOOLS, EQUIPMENT AND PERSONS.
- THE THRUST REVERSERS ARE CLOSED AND LOCKED.
- THE THROTTLE CONTROL LEVER OF THE RELATED ENGINE IS IN THE IDLE POSITION.
- THE TEST IS PERFORMED IN A CLEAN AREA, I.E. POTENTIAL FOD WERE REMOVED.

- MAKE SURE THAT THE AIRCRAFT IS POINTED INTO THE WIND.

WARNING : YOU MUST MAKE SURE THAT THE AREA AROUND THE THRUST REVERSER IS CLEAR OF PERSONS AND EQUIPMENT BEFORE YOU OPERATE IT. THE THRUST REVERSER TRANSLATING DOORS MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS AND/OR DAMAGE TO EQUIPMENT.

CAUTION : DO NOT OPERATE THE ENGINE IN REVERSE THRUST WITH THE FAN AND CORE COWL DOORS OPEN. IF THE DOORS ARE OPEN, DAMAGE TO THE ENGINE AND THE DOORS CAN OCCUR.

A. Equipment and Materials

ITEM	DESIGNATION
Referenced Procedures	
- 24-41-00, P. Block 301	AC External Power Control
- 71-00-00, P. Block 201	Power Plant - General

B. Job Set-Up

WARNING : BEFORE STARTING ONE OR BOTH ENGINES, ALL SAFETY AND OPERATING AIRCRAFT PRECAUTIONS MUST BE OBSERVED TO IMMOBILIZE AIRCRAFT (REF. 71-00-00, P. BLOCK 201).

NOTE : This test also pressurizes various systems at idle power to permit a thorough leak check of components replaced.

NOTE : Make sure that the engine 1(2) shutdown occured not less than 5 minutes before you do this procedure.

(1)Make sure that these circuit breakers are closed:

PANEL	DESIGNATION	FIN.	LOCATION
For ENG 1			
133VU	ENGINES/ENG1/REVERSE/CTL	1KM	332/U69
133VU	ENGINES/ENG1/REVERSE/WARN	3KM	332/U68
133VU	ENGINES/ENG1/THRUST REVERSER LOCK	45KM	332/U67
133VU	ENGINES/IGNITION/ENG1/SYS A	1JH	334/S72
133VU	ENGINES/IGNITION/ENG1&2/SYS B	2JH	333/T72
133VU	ENGINES/ENG1/FUEL HP VALVE/CTL	3KC	333/T69
22VU	FADEC/MODE WARN/ENG1	17KS	204/F22
For ENG 2			
133VU	ENGINES/ENG2/REVERSE/CTL	2KM	331/V74
133VU	ENGINES/ENG2/REVERSE/WARN	4KM	331/V73
133VU	ENGINES/ENG2/THRUST REVERSER LOCK	44KM	331/V75
133VU	ENGINES/IGNITION/ENG2/SYS A	8JH	333/T71
133VU	ENGINES/IGNITION/ENG1&2/SYS B	2JH	333/T72
133VU	ENGINES/ENG2/FUEL HP VALVE/CTL	4KC	333/T70
22VU	FADEC/MODE WARN/ENG2	16KS	204/F23

(2)Safety precautions (Ref. 71-00-00, P. Block 201).

C. Procedure

(1)Start the engine.

(a)Prepare, service and start engine as described in 71-00-00, P. Block 201.
(b)Allow N2 to stabilize at MINIMUM IDLE for 5 minutes.
(c)On right ECAM display unit (ENG page):
1 Check that operating indications are within the operating limits (Ref. 71-00-00, P. Block 201).
2 Check N1 vibration indication (Ref. 71-00-00, P. Block 201).
3 Check N2 vibration indication (Ref. 71-00-00, P. Block 201).
(2)Do a thrust reverser cycling test (engine running).
NOTE : During the different phases of the thrust reverser cycle, ensure that indicating is in accordance with Table 1. In order to make sure that the system operates properly, perform the thrust reverser cycling five (more) times as follows.
(a)Move the ENG 1(2) thrust reverser lever to the REVERSE IDLE hard point.
1 The translating cowl should deploy.
NOTE : The translating cowl should be deployed before five secondes.
2 In the flight compartment, the REV UNLOCK light must illuminate when the thrust reversers operate, and turn off when the thrust reversers are fully deployed, while the REV light shall illuminate.
3 EPR on ENG 1(2) shall increase.
(b)Move the ENG 1(2) thrust reverser throttle lever back to the forward idle stop.
1 The translating cowl should be stowed.
NOTE : The translating cowl should be stowed before four secondes.
2 In the flight compartment, the REV UNLOCK light must illuminate when the thrust reversers operate, and turn off when the thrust reversers are fully stowed.

Position	REV UNLOCK light	REV light
Stowed	OFF	OFF
In deployment	AMBER	OFF
Deployed	OFF	GREEN
Stowing	AMBER	OFF
Stowed	OFF	OFF

Flight Compartment Indicating
Table 1

D. Close-Up
(1)After test completion, shut down the engine (Ref. 71-00-00, P. Block 201).
(2)Make sure that the work area is clean and clear of tools and miscellaneous items of equipment.
(3)De-energize the aircraft electrical circuits (Ref. 24-41-00, P. Block 301).

THRUST REVERSER SYSTEM CONTROL - INSPECTION/CHECK

1. Functional Check of Thrust Reverser Master Actuator Secondary Lock

A. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breakers Safety Clips
B.	Wrench (Hex-Drive Male)
C.	Wedge Primary, Secondary Lock
D.	Access Platform
Referenced Procedures	
- 24-41-00, P. Block 301	AC External Power Control
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-15, P. Block 201	Actuators - Masters and Slaved

**ON A/C 101-200,

B. Procedure

CAUTION : THRUST REVERSER DOORS MUST BE CLOSED AND LATCHED BEFORE OPERATION OF ANY THRUST REVERSER SYSTEM.

(1)Job set-up

(a)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).

(b)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(c)Install access platform

(2)Check the master actuator secondary lock

(a)Unlock the PDU primary brake handle and support it in the unlock position (Ref. Fig. 601, 602).

CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCKED POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER.

(b)Manually unlock synchronous shaft lock assembly.

(c)With both master actuators fully on stow stops, check that both master actuator secondary lock indicators are pointing to the right hand delta symbol, within the width of the delta symbol.
If not, resynchronize the secondary lock (Ref. 78-31-15, P. Block 201) (Ref. Fig. 603).

(d)Using hex-drive wrench and counting the turns, extend sleeve assemblies. After nine to ten turns the secondary lock will engage and further movement in the deploy direction will be halted.
(The translating sleeves will be extended about 1/2 inch (12.700 mm) from fully stowed position).

(e)Return sleeve assemblies to fully stowed position.
NOTE : If translating sleeve is not held in place to compensate for the bulb seal compression, the actuator traveling tube will not come to full stow and REV UNLK light may come on.
(f)Repeat extend operation Steps (a) through (c), but after each turn withdraw and release master actuator secondary lock handle from left master actuator, then the right master actuator. After two to three turns, secondary lock handle withdrawal must be mechanically restrained.
(g)Return sleeve assembly to fully stowed position and release the PDU primary brake handle.
NOTE : To ensure that translating sleeves are at full stow, use a hex-drive wrench to apply pressure to compensate for bulb seal compression to ensure that actuator traveling tube dog stops are in full contact (Ref. Fig. 604).
(h)Withdraw left master actuator secondary lock handle. Check that REV UNLK indicator light comes on on flight compartment control panel. Release handle ; REV UNLK indicator light goes off.
(i)Repeat previous step with right master actuator secondary lock handle.
(3)Close-up
(a)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(b)Return the manual unlock lever of both synchronous shaft locks in normal position.
(c)Remove access platform.
(d)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).
(e)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

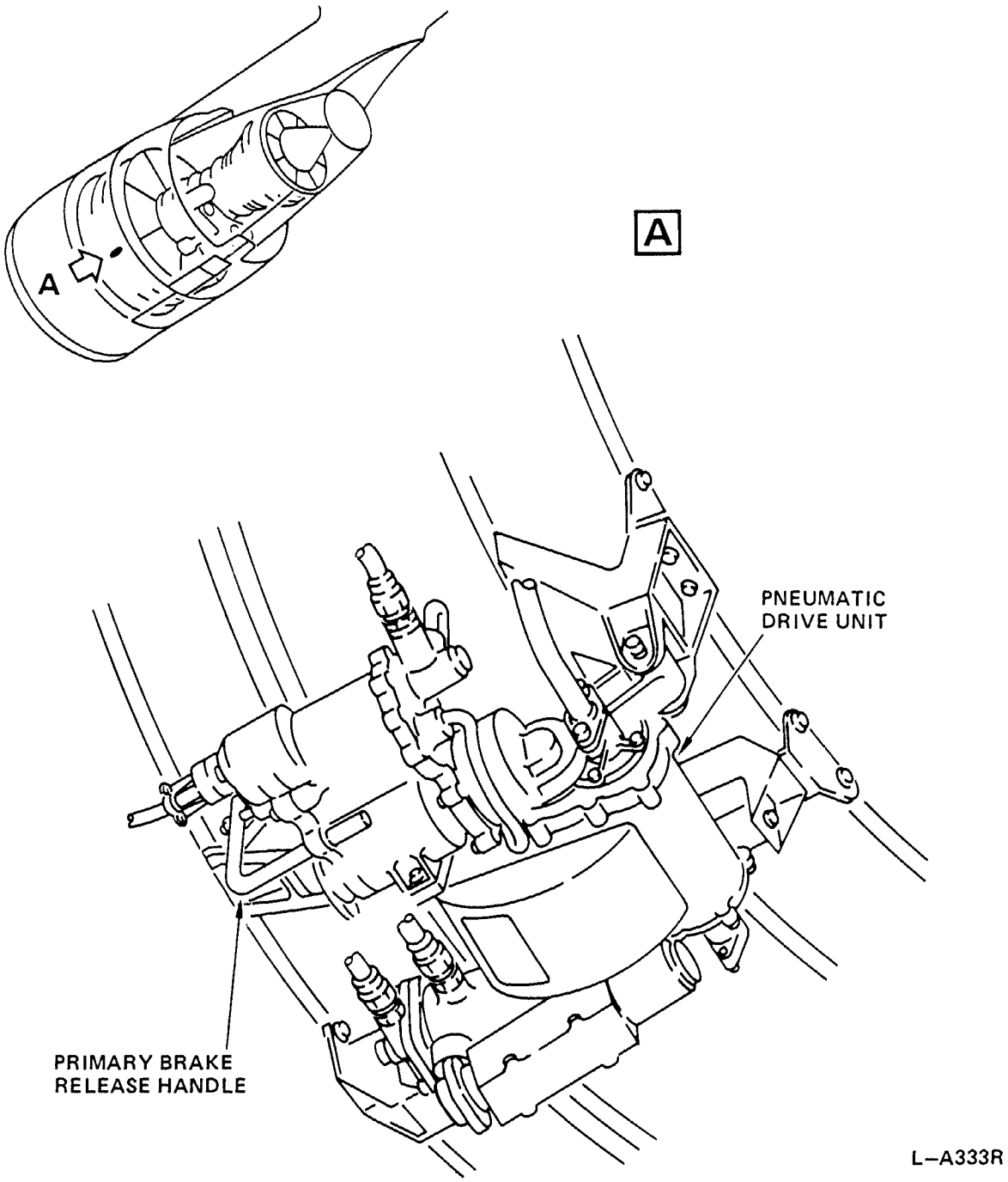
**ON A/C 101-200,

2. Operational Test of Stow and Deploy Switches, Master Actuator Secondary Lock Switches and PDU Brake Indicator Switch

A. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breakers Safety Clips
B.	Wrench (Hex-Drive Male)
C.	Multimeter
D.	Access Platform
Referenced Procedures	
- 24-41-00, P. Block 301	AC External Power Control
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-00, P. Block 501	Thrust Reverser System Control
- 78-32-11, P. Block 501	Translating Sleeves - Thrust Reverser

B. Procedure



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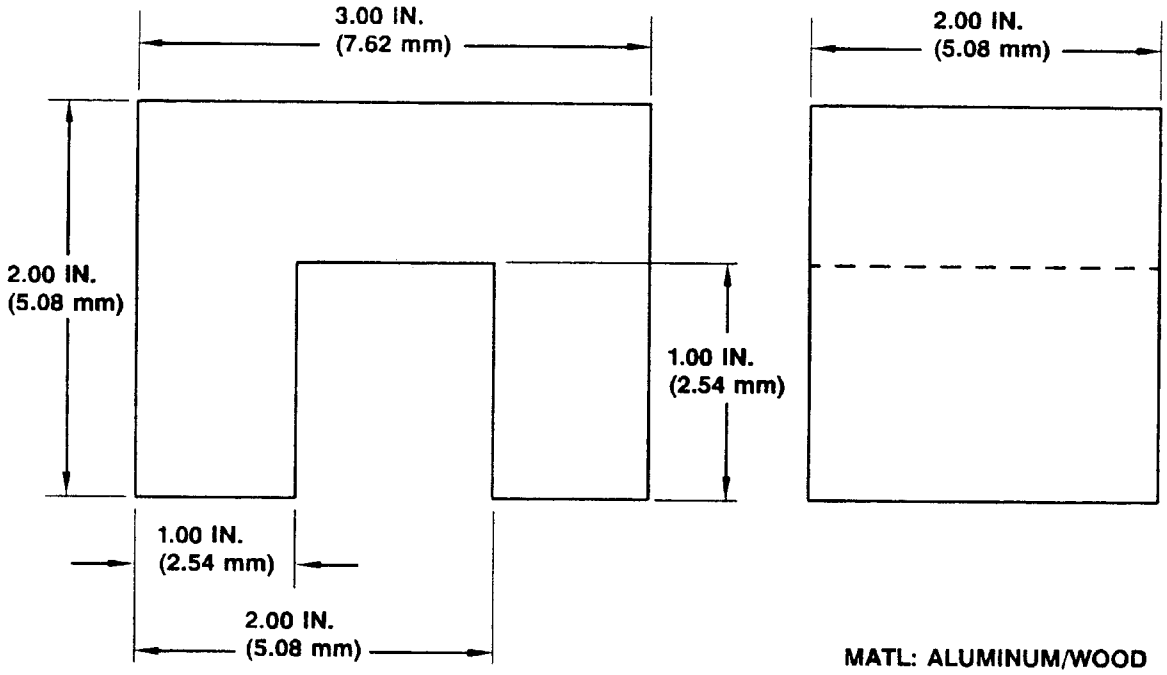
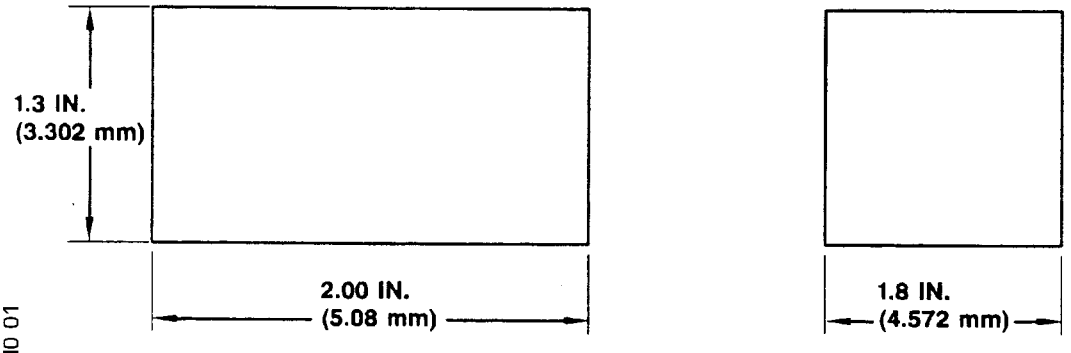
Thrust Reverser Pneumatic Drive Unit (PDU)
Figure 601



SECONDARY LOCK WEDGE



PRIMARY LOCK WEDGE

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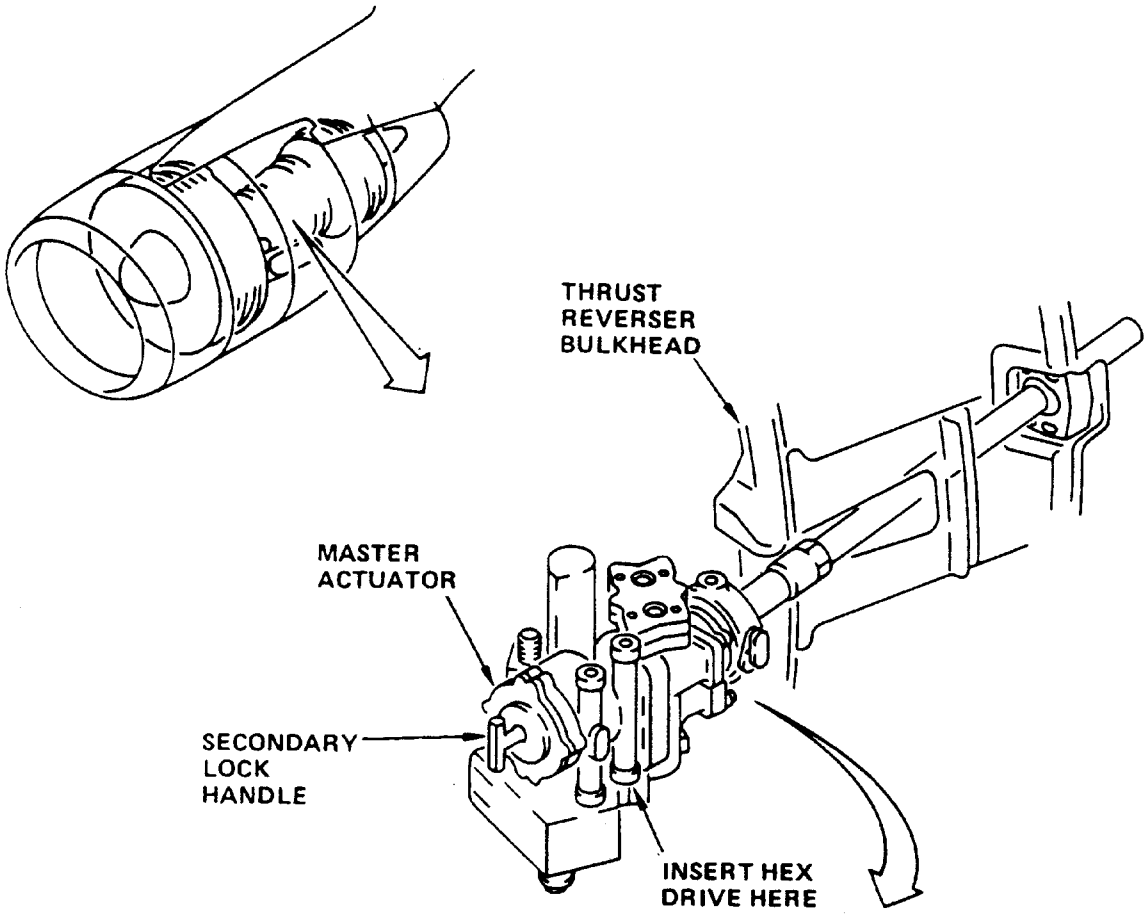
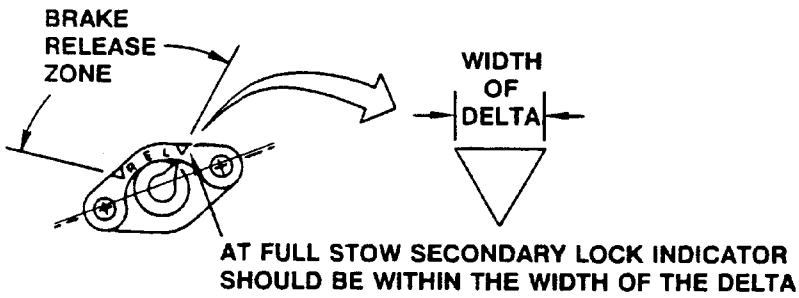
Lock Wedge Tool Design
Figure 602





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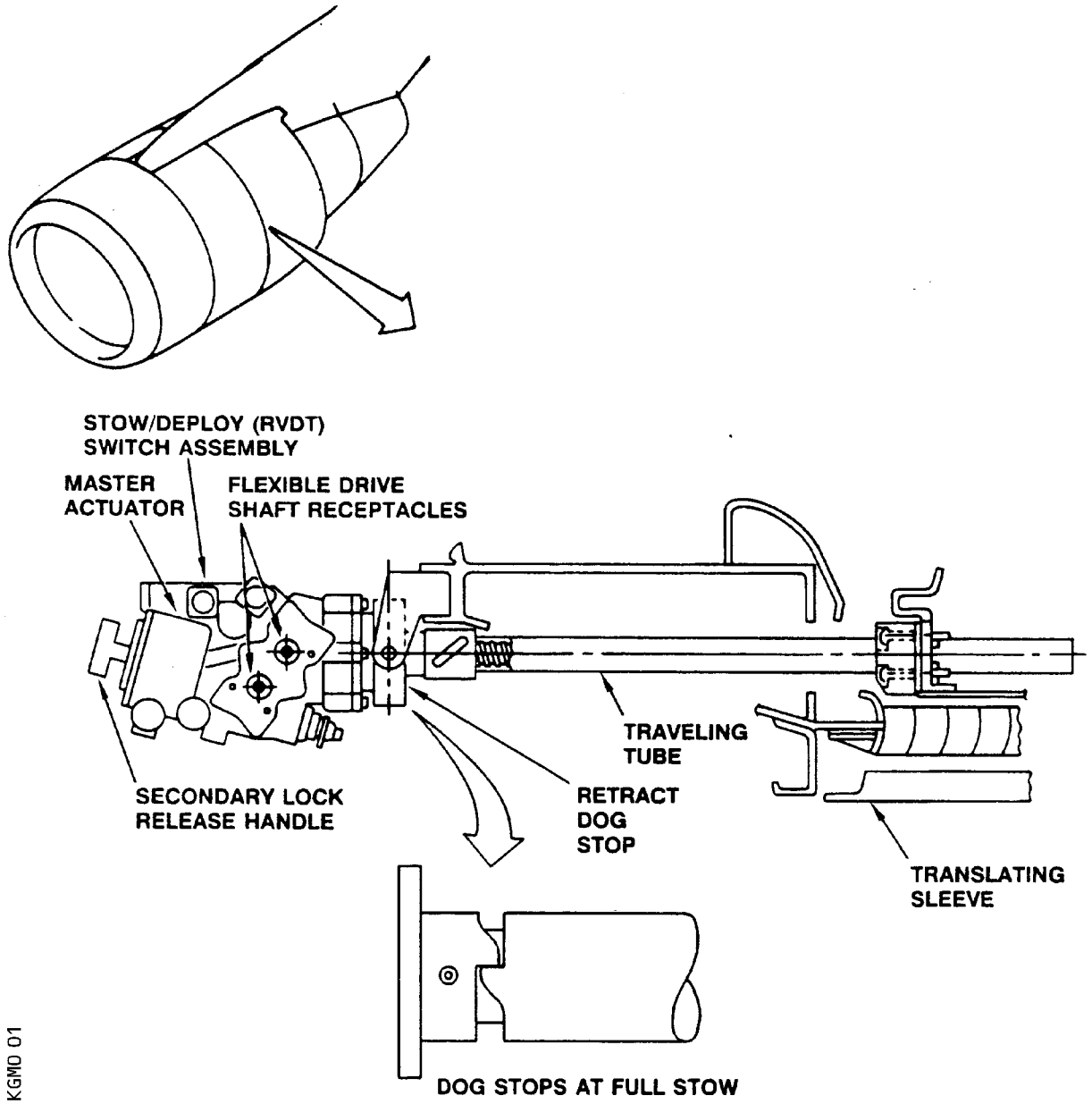
Thrust Reverser Master Actuator
Figure 603



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Dog Stops at Full Stow
Figure 604

(1)Job set-up
  (a)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
    NOTE : Make certain that electrical power is provided to all indication switches and flight compartment indication circuits.
  (b)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
  (c)Install access platform.
(2)Check master actuator lock indication switch and PDU brake indication switch (Ref. Fig. 601, 603).
  (a)With thrust reverser fully stowed, observe flight compartment indicator lights. Both REV and REV UNLK indicator lights must not be on.
  (b)With thrust reverser still fully stowed, pull right-hand master actuator lock T-handle. Force to pull T-lock handle on be about 20 lbs. (9.07 kg). The REV UNLK indicator light must come on.
  (c)Release lock T-handle. The T-handle must retract immediately without assistance and REV UNLK indicator light must not be on.
  (d)Repeat steps (b) and (c) for left-hand master actuator.
  (e)Pull PDU brake handle. REV UNLK indicator light must come on.
  (f)Release PDU brake handle. The handle must retract immediately without assistance and REV UNLK indicator light must not be on.
(3)Check the stow and deploy switches
  (a)Check electrical system (Ref. 78-31-00, P. Block 501).
  (b)Re-connect all connectors disconnected and perform an operational test of the translating sleeves (Ref. 78-32-11, P. Block 501).
(4)Close-up
  (a)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
  (b)Remove access platform.
  (c)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).
  (d)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

THRUST REVERSER SYSTEM CONTROL - DEACTIVATION/REACTIVATION

1. Failure of thrust reverser system
Ref. : MMEL Sect. 1-78, Item 1 (Thrust Reversers)

A. Deactivation
(1)Equipment and Materials

ITEM	DESIGNATION
(a)	Wrench - Hex Drive Male 0.375 in.
(b)	Warning Notice
(c)	Blanking caps
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 73-38-00, P. Block 501	FADEC Ground Test
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves

(2)Job set-up
(a)Open safety and tag appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(3)Procedure
CAUTION : TO PREVENT BINDING, MAKE CERTAIN THAT THRUST REVERSER DOORS ARE LOWERED AND LATCHED BEFORE OPERATING TRANSLATING SLEEVES.
(a)Close thrust reverser doors (Ref. 71-13-00, P. Block 301).
WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.
(b)Make certain that ground air duct is not connected to ground operation air transfer pneumatic valve.
(c)Manually stow translating sleeves if malfunction has occurred in partially or fully deployed position (Ref. 78-32-11, P. Block 201).
(d)Check that all structural components of the reverser are free from obvious physical damage.
- Check on both master actuators that secondary lock is engaged.
- At each actuator, check that fittings are not damaged.
- Check that there is no sleeve deformation/distortion of the sleeve.

(e)At each of four slave actuators (Ref. Fig. 901) :
- Remove two bolts attaching cover/lockout adapter to slave actuator.
- Reverse and reinstall adapter in actuator with same two bolts. If unable to engage actuator gear shaft while aligning adapter mounting holes with those in actuator, use 0.375 in. (9.52 mm) male hex drive wrench to rotate actuator gear shaft enough, 1/6 turn maximum, for alignment.

(f)At pressure regulator and shutoff valve (Ref. Fig. 902) :
- Disconnect electrical connector DH9.
- Install blanking caps on solenoid receptacle and connector. Secure harness.
- Using wrench manually set valve to CLOSED.

(g)At both master actuators, disconnect the stow/deploy switch.

- Disconnect electrical connectors DS301 on right side and DS307 on left side.
- Install protective covers on receptacles and connectors.
- Firmly secure the harness to structure with tying tape.

(h)Verify that the FADEC Ground test display is available on the right ECAM (Ref. 73-38-00, P. Block 501, for the engine being deactivated). On the right ECAM FADEC Ground test display, verify that REV percent is 0 percent +/- 2 percent for CH A and CH B.

(4)Close-up

(a)Close fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.

(b)Placard a warning notice on thrust reverser control lever in flight compartment to indicate that thrust reverser is deactivated and locked out.

(c)Make entry in log book that thrust reverser system has been manually locked out.

B. Reactivation

(1)Equipment and Materials

ITEM	DESIGNATION
(a)	Wrench - Hex Drive Male 0.375 in.
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

(2)Job set-up

(a)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).

(3)Procedure

(a)At each of four slave actuators (Ref. Fig. 901) :

- Remove two bolts attaching cover/lockout adapter to slave actuator.
- Reverse and reinstall cover/lockout adapter using same two bolts.

(b)At pressure regulator and shutoff valve (Ref. Fig. 902) :

- Pull down the spring loaded locking lever to release lock then, using wrench, manually set valve to OPEN position.
- Remove blanking caps from solenoid receptacle and electrical connector DH9.
- Connect electrical connector DH9 to valve receptacle. Tighten connector handtight plus 1/8 turn.

(c)At both master actuators :

- Remove protective covers from receptacles and electrical connectors DS301 and DS307.
- Connect electrical connectors DS301 and DS307 to receptacle. Tighten connector handtight plus 1/8 turn.

(d)Remove warning notice in flight compartment.

(4)Close-up and test

(a)Close fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.

(b)Perform operational test of thrust reverser translating sleeves

(Ref. 78-32-11, P. Block 501).

2. Failure of REV indicator light circuit

Ref. : MMEL Sect. 1-78, Item 3 ("REV" lt.)

A. Deactivation

(1)Reason for the job

Failure of REV indicator light circuit.

REV indicator light operational test

(2)Referenced procedures

ITEM	DESIGNATION
- 71-13-00, P. Block 301	Cowl Doors
- 24-41-00, P. Block 301	AC External Power Control
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 23-44-00, P. Block 501	Cabin and Service Interphone

(3)Procedure

(a)Job set-up

WARNING : MAKE CERTAIN THAT CIRCUIT BREAKERS ARE OPEN, SAFETIED AND TAGGED BEFORE ATTEMPTING MAINTENANCE PROCEDURE. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

1 Open, safety and tag the appropriate circuit breakers and open RH fan cowl door (Ref. 71-13-00, P. Block 301).

2 Connect electrical ground power and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

3 Connect interphone system between flight compartment and the appropriate engine area (Ref. 23-44-00, P. Block 501).

4 Activate reverser manually (Ref. 78-32-11, P. Block 201).

(b)Test

1 Remove safety clips and tags and close the appropriate circuit breakers.

2 Perform the following test :

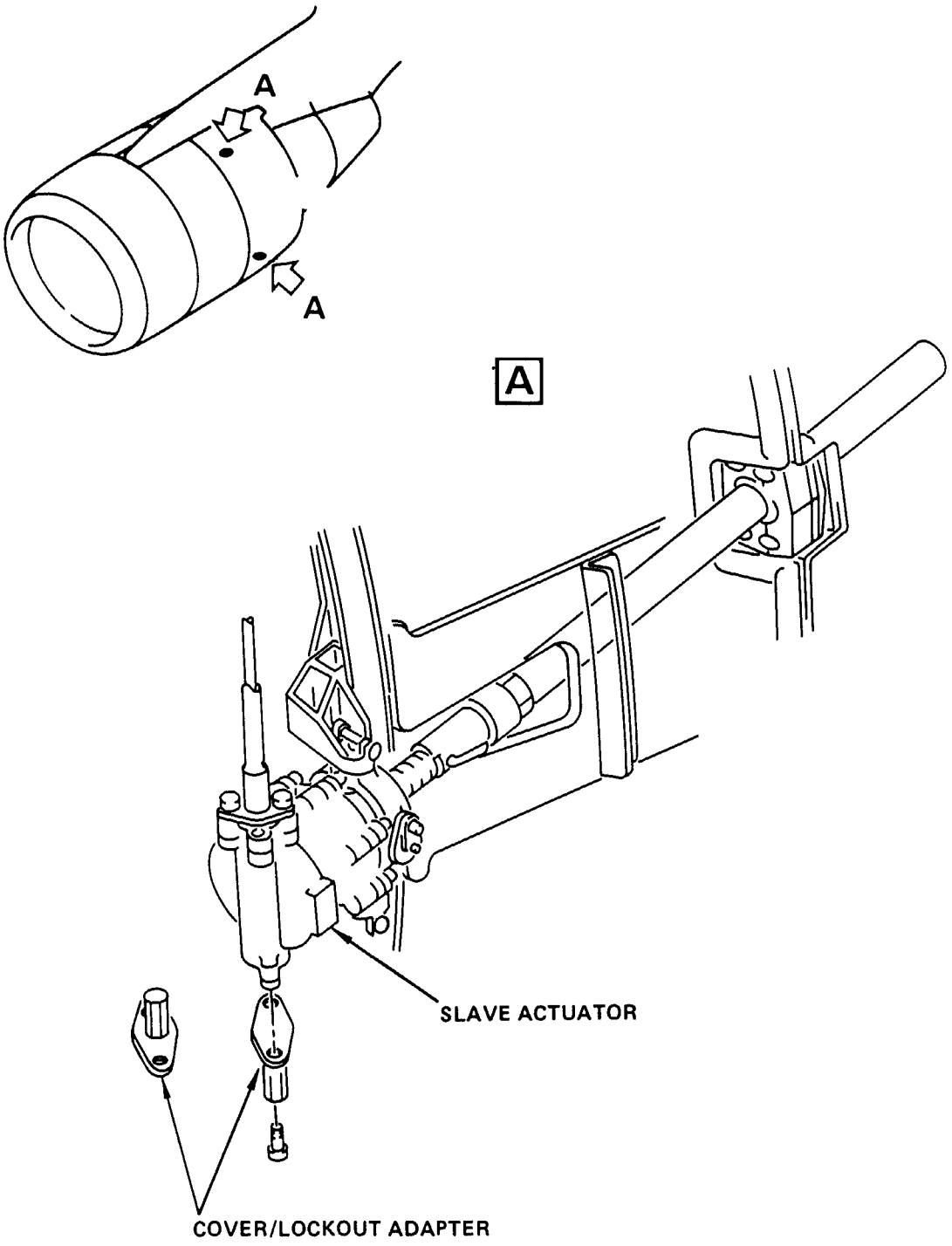
ACTION	RESULT
1. Move thrust reverser control lever to idle position and manually R deploy translating sleeves from R stow position to the middle of the deploy travel.	Check that : - REV UNLK warning light comes on
2. Deploy translating sleeves to full stop deploy position. R R R R	Check that : - REV UNLK warning light goes off. - Verify that REV percent is 100% ± 2% for Ch A and Ch B on the right ECAM FADEC ground test display.
3. Move translating sleeves from deploy position to the middle of the	Check that : - REV UNLK warning light comes on.

ACTION	RESULT
stow travel.	
4. Stow translating sleeves to full stop stow position.	Check that : - REV UNLK warning light goes off. - Verify that REV percent is 0% ± 2% for Ch A and Ch B on the right ECAM FADEC ground test display.

(c)Close-up

1 Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
2 De-energize the aircraft electrical network and disconnect electrical ground power unit.
3 Close right fan cowl door (Ref. 71-13-00, P. Block 301).
4 Remove safety clips and tags and close the appropriate circuit breakers.
5 Disconnect interphone system between flight compartment and the appropriate engine area.
6 Install a temporary placard in the flight compartment to warn the crew members that REV indicator light 11KM (12KM) is inoperative.

B. Reactivation
Refer to TSM 78-31-00.



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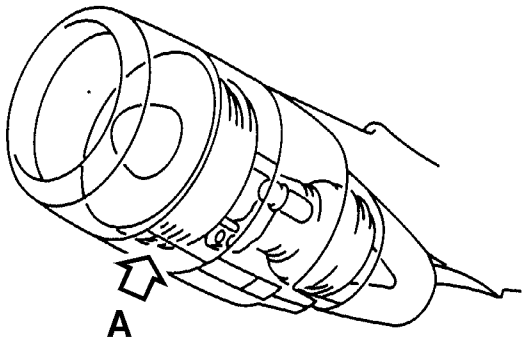
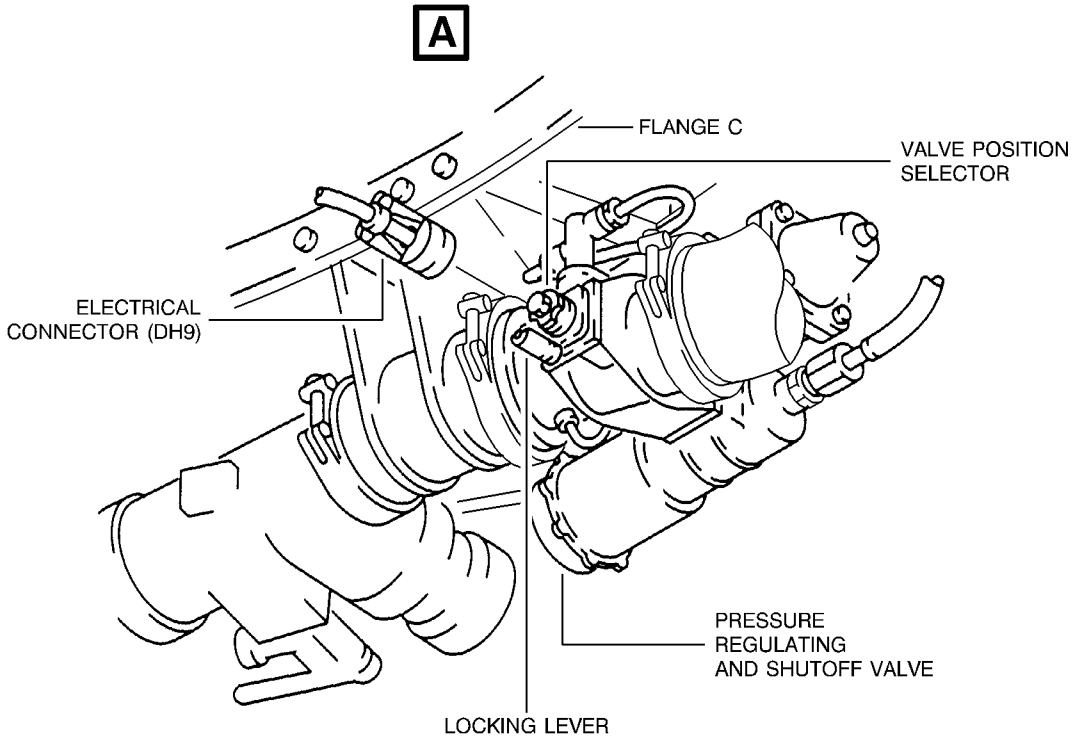
DM5

Slave Actuator Cover/Lockout Adapter
Figure 901





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Pressure Regulating and Shut Off Valve
Figure 902

PNEUMATIC DRIVE UNIT - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B. Material No.P03-001	Oils (Ref. 70-00-00)
C. Material No.P06-013	Lubricants (Ref. 70-00-00)
D. Material No.P06-017	Lubricants (Ref. 70-00-00)
E.	Protective Caps
F.	Corrosion Resistant Steel Lockwire (MS9226-04) (Ref. 70-00-00)
G.	Packing
H. RSE1079	Hose, Ground Air Supply
I.	Torque Wrench
Referenced Procedures	
- 24-41-00, P. Block 301	AC External Power Control
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

PANEL	SERVICE	IDENT.	LOCATION
FOR ENGINE 1			
133VU	ENGINES/ENG1 REVERSE WARN	3KM	332/U68
FOR ENGINE 2			
133VU	ENGINES/ENG2 REV WARN	4KM	331/V73

(2)Open left fan cowl door (Ref. 71-13-00, P. Block 301).

B. Removal (Ref. Fig. 401)

CAUTION : DO NOT UNLOCK (PULL) PDU BRAKE WHEN THE PDU IS DISCONNECTED FROM THE MASTER ACTUATORS OR WHEN THE DRIVE CABLE ARE DISCONNECTED. FAILURE TO COMPLY COULD RESULT IN MISADJUSTMENT OF THE PDU. DO NOT UNCOUPLE OR COUPLE A PDU WHEN THE REVERSER IS STOWED. PDUS ARE RIGGED WITH PRESSURIZED AIR TO NOMINAL DEPLOY. NOMINAL DEPLOY IS THE ONLY POSITION TO WHICH A PDU WILL REPEATEDLY RIG.

(1)Remove lockwire, screws, and washers attaching flexible shaft to PDU and remove shaft.

(2)Disconnect three hoses from pneumatic drive unit and remove unions and packings. Discard packings.

(3)Disconnect electrical connector from PDU and install protective caps on connector and PDU receptacle and ports.

(4)Remove coupling connecting duct to PDU.

(5)Remove bolts, nuts, and washers attaching PDU to brackets.

(6)Remove PDU from fan case and install protective caps on duct and PDU port.

C. Installation (Ref. Fig. 401)

(1)Remove protective caps from PDU (1) and flexible duct. Apply lubricant Material No.P06-013 to inside surface of coupling and position on end of flexible duct.

(2)Position pneumatic drive unit on brackets, and install bolts (6) in upper forward and aft bracket holes.

(3)Install and tighten bolt (6) and washer (7) in lower forward bracket fingertight.

(4)Install washers (7) and nuts (8) on bolts in upper and lower aft brackets and TORQUE all nuts and lower forward bolt to between 160 and 190 lbf.in. (1.8 and 2.14 m. daN).

(5)Install coupling (2) on PDU and duct flanges. Torque coupling to value marked on coupling.

(6)Apply lubricant, Material No.P06-017, to threads of unions.

(7)Install union (11) with new packing (12) in PDU. TORQUE union (11) to between 125 and 140 lbf. in. (1.41 and 1.58 m. daN).

(8)Install union (5) with new packing (4) in PDU. TORQUE union (5) to between 115 and 130 lbf.in. (1.29 and 1.47 m. daN).

(9)Install union (3) with new packing (13) in PDU and TORQUE to between 90 and 100 lbf.in. (1.02 and 1.13 m. daN).

(10)Connect electrical connector DS304 to PDU and tighten fingertight plug one-eighth turn

(11)Manually translate thrust reverser sleeves to the full deploy (extend) position. (Ref. 78-32-11, P. Block 201).

(12)With hex wrench inserted in master actuator, slowly rotate wrench 7 1/2 turns moving translating sleeves in stow direction.

NOTE : If the replacement PDU requires adjustment follow instructions in Paragraph E., then return to Step C. (13).

(13)Connect hose couplings and :

- TORQUE hose on union (3) to between 135 and 150 lbf. in. (1.52 and 1.69 m. daN).
- TORQUE hose on union (5) to between 180 and 200 lbf. in. (2.03 and 2.26 m. daN).
- TORQUE hose on union (11) to between 270 and 300 lbf. in. (3.05 and 3.39 m. daN).

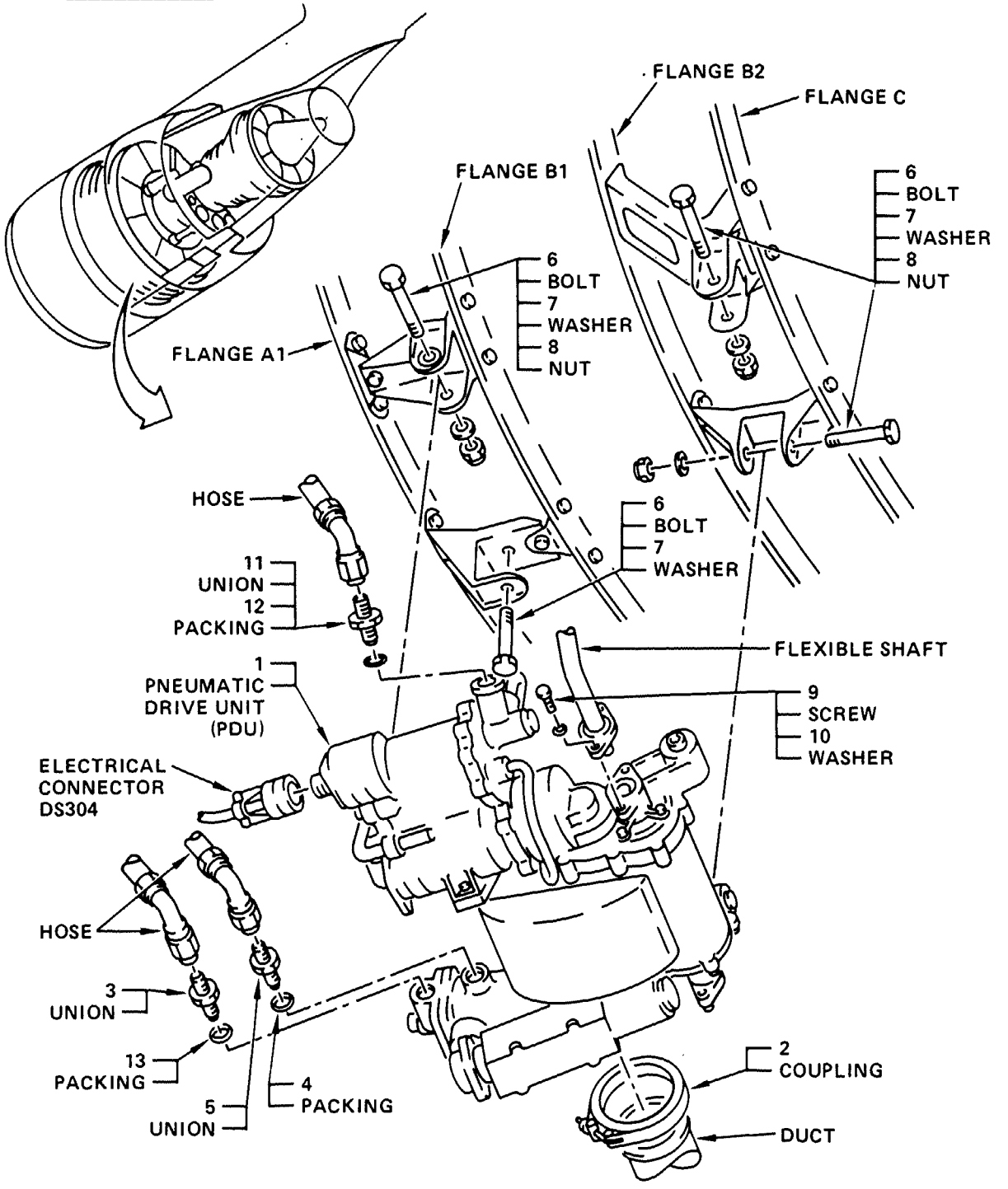
NOTE : Replacement PDUs will normally be pre-adjusted, tagged and lock-wired. Tag reads "UNIT CALIBRATED. DO NOT PULL HANDLE. REMOVE TAG PRIOR TO OPERATION". These units can be installed in the system without further adjustment. A PDU without a tag must be adjusted, after installation.

(14)If PDU is not pre-adjusted, adjust it as per paragraph E.

(15)Install flexible shaft on PDU with screws (9) and washers (10). TORQUE screws to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN) and wirelock.

NOTE : Thrust reverser sleeve position must be fully deployed and then seven and one half (7 1/2) turns in the stow direction.

D. Close-Up and Test



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Pneumatic Drive Unit (PDU)
Figure 401

(1)Manually translate thrust reverser sleeves to stow (retract) position (Ref. 78-32-11, P. Block 201).
(2)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(3)Close left fan cowl door (Ref. 71-13-00, P. Block 301).
(4)Remove safety clips and tags and close circuit breakers : 3KM, 4KM.
(5)Perform operational test (Ref. 78-32-11, P. Block 501).

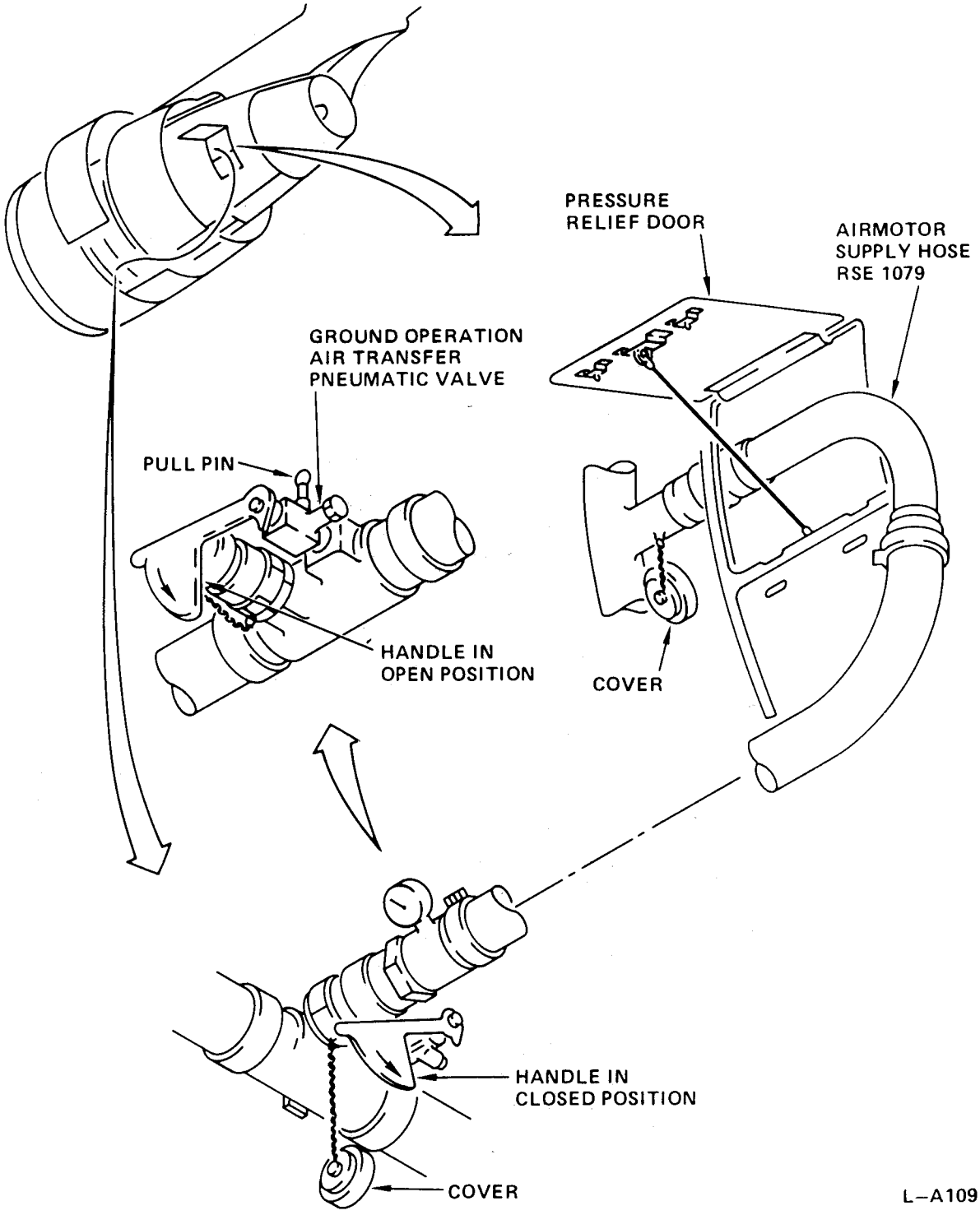
E. Adjustment (Ref. Fig. 402)

CAUTION : ENSURE FLEXIBLE DRIVE SHAFT IS DISCONNECTED FROM PDU, AS SYSTEM COMPONENTS COULD BE DAMAGED.

(1)Open IDG/starter access door, remove cover from starter air supply duct coupling and attach air supply hose (RSE 1079).
(2)Pull pin on ground air valve and move handle to closed position. While holding spring loaded handle in closed position, remove cover from ground air valve port and attach air supply hose to valve port.
(3)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(4)Pressurize PDU by applying inlet pressure between 34 and 38 psig (2.34 and 2.62 bars).

CAUTION : MAKE CERTAIN THAT INLET PRESSURE IS ABOVE 25 PSIG TO FULLY ENERGIZE THE SYSTEM.

(5)Energize the selector valve deploy solenoid by setting thrust reverser control lever to deploy position. The PDU will rotate to a position correlated to the actuator full deploy position less 7 1/2 turns. The brake will automatically be applied.
(6)Cut off pneumatic power source and set thrust reverser control lever to stow position.
(7)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(8)Remove air supply hose from starter air duct coupling and ground air valve. Install covers and open ground air valve.
(9)Close IDG/starter access door.



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Pneumatic Drive Unit Adjustment
Figure 402

PNEUMATIC DRIVE UNIT - INSPECTION/CHECK

1. Check Pneumatic Drive Unit (PDU)

A. General
(1) This procedure provides instructions for visually inspecting the Pneumatic Drive Unit (PDU) for indication of overheating.
(2) A check of the PDU temperature monitor label is only necessary when troubleshooting the thrust reverser system. However, it can be performed during routine servicing/operational/rigging check. (Follow label instructions : indicator dot(s) will turn black in color if the unit has been exposed to the stated temperature).
(3) Access to the PDU is through the left fan cowl door.

2. Equipment and Materials

ITEM	DESIGNATION
Referenced Procedures	
- 78-30-00, P. Block 201	Thrust Reverser

3. Procedure

A. Job Set-Up
(1) Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).

B. Inspect Pneumatic Drive Unit
(1) Inspect PDU as per periodic check of thrust reverser actuation system (Ref. 78-30-00, P. Block 201).

C. Close-Up
(1) Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

PRESSURE REGULATING AND SHUT OFF VALVE - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B. Material No.P06-013	Lubricants (Ref. 70-00-00)
C. Material No.P06-002	Lubricants (Ref. 70-00-00)
D. Material No.P03-001	Oils (Ref. 70-00-00)
E.	Packings
F.	Protective Covers
G.	Torque Wrench
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

2. Procedure

A. Job Set-Up
(1)Open, safety and tag circuit breakers and open left fan cowl door. (Ref. 71-13-00, P. Block 301).
(2)Make certain that the Ground Air Supply Hose is removed and coupling cap is installed onto starter air supply duct.

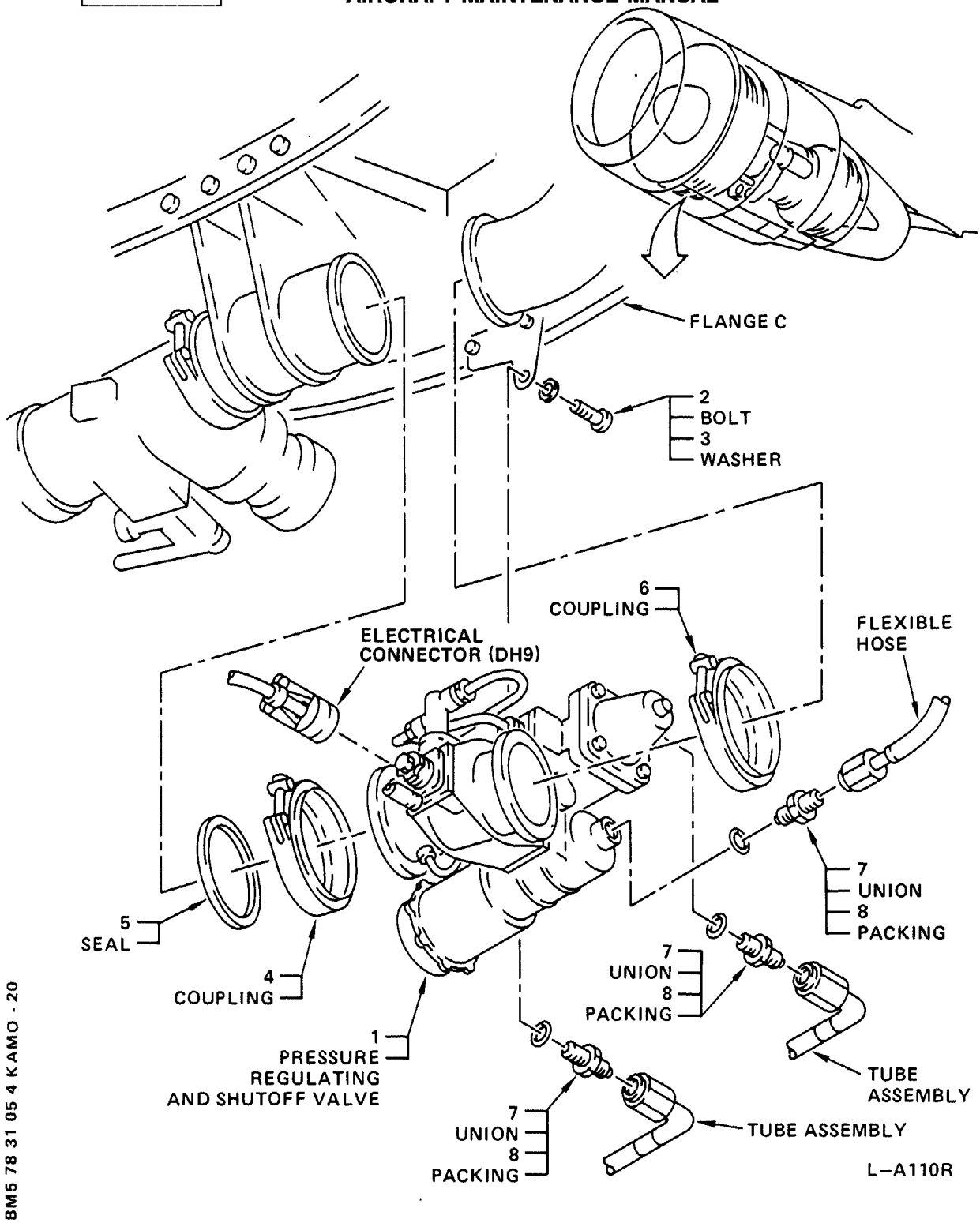
B. Removal (Ref. Fig. 401)
(1)Disconnect thrust reverser pneumatic sensor tubes from valve and install protective covers on tubes and ports.
(2)Remove unions and packings from valve.
(3)Disconnect flexible hose from valve.
(4)Disconnect electrical connector DH-9 from receptacle.
(5)Install protective cover on connector.
(6)Remove coupling and seal from valve inlet. Seal is reusable. Do not discard.
(7)Remove coupling from valve outlet.
(8)Remove bolt and washer attaching valve to Flange C.
(9)Remove valve and install protective covers on open ducts and ports.

C. Installation (Ref. Fig. 401)
(1)Remove protective covers from valve (1) and ports.
(2)Install unions (7), threads lubricated with Material No.P03-001, and new packings (8), lubricated with Material No.P06-002, in valve and torque.
(3)Install valve on fan case with bolt (2), threads lubricated with Material No.P03-001, and washer (3).
(4)Apply Material No. P06-013 to inside of duct couplings.
(5)Install coupling (6) on valve outlet and coupling (4) and reusable seal (5) on valve inlet. TORQUE couplings to value marked on band.
(6)Connect flexible hose and tubes to valve and TORQUE hose and tube couplings to between 270 and 300 lbf. in. (3.05 and 3.39 m.daN).
(7)Remove protective cover and connect electrical connector DH-9 to valve.

Tighten fingertight plus one-eighth turn.

D. Test
(1)Perform test (Ref. 78-32-11, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close left fan cowl door (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.



Pressure Regulating and Shut off Valve
Figure 401

SOLENOID OPERATED SELECTOR VALVE - REMOVAL/INSTALLATION

R

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Packings
C.	Protective Caps
D. Material No.P03-001	Oils (Ref. 70-00-00)
E. Material No.P06-002	Lubricants (Ref. 70-00-00)
	Torque Wrench
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).

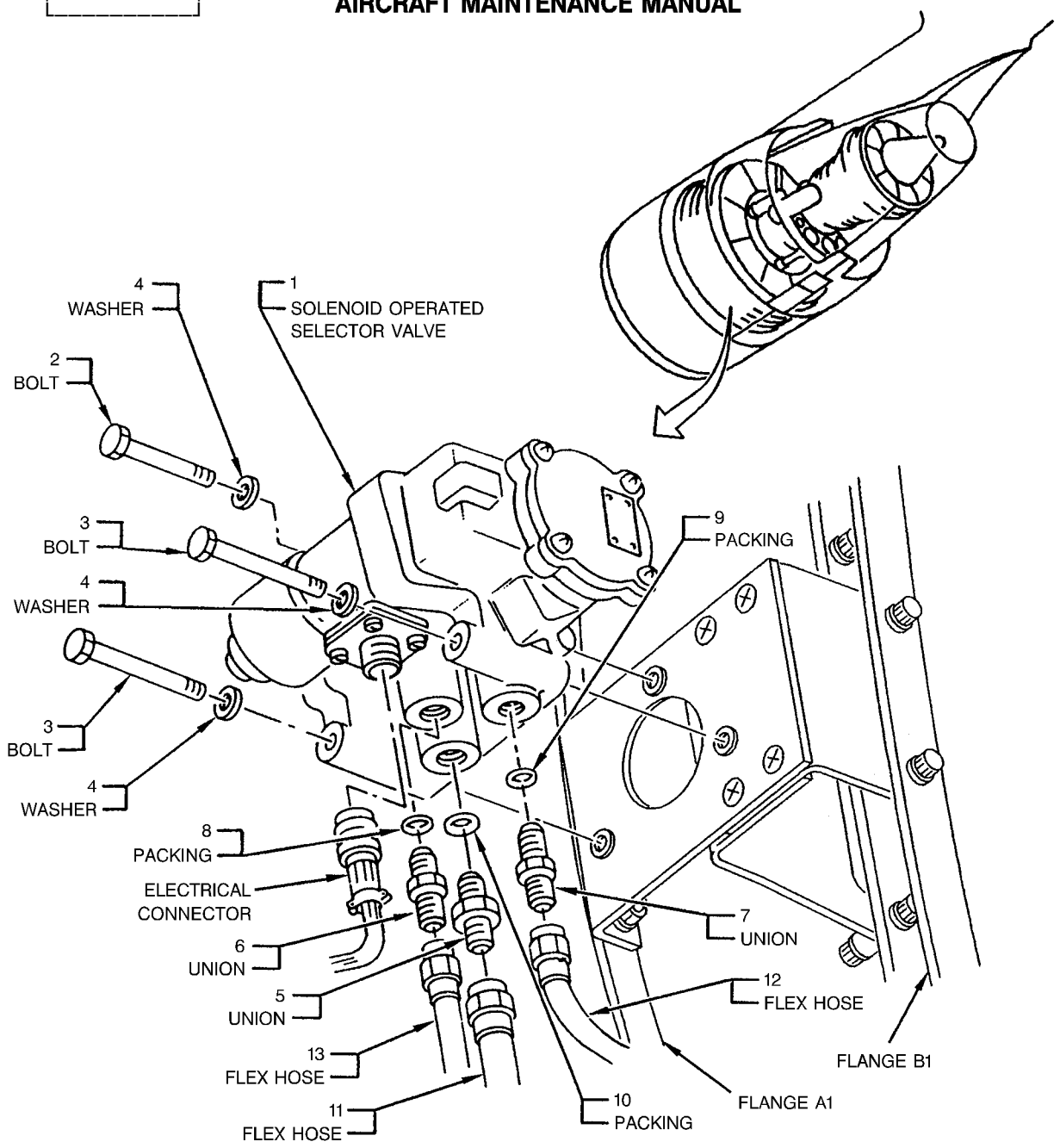
B. Removal (Ref. Fig. 401)
(1)Disconnect three flex hoses from valve. Install protective caps on hose couplings.
(2)Disconnect electrical connector from valve receptacle. Install protective caps on connector and receptacle.
(3)Remove three bolts and washers attaching valve to bracket.
(4)Remove valve.
(5)Remove three unions from valve. Install protective caps in valve ports. Remove and discard packings from three unions.

C. Installation (Ref. Fig. 401)
(1)Remove protective caps from valve ports.
(2)Install new packing (10), lubricated with Material No.P06-002, on union (5). Install union, threads lubricated with Material No.P03-001, in valve (1). TORQUE union to between 125 and 140 lbf.in. (1.412 and 1.581 m.daN).
(3)Install new packing (9) lubricated with Material No.P06-002, on union (7). Install union, threads lubricated with Material No.P03-001, in valve (1). TORQUE union to between 90 and 100 lbf.in. (1.017 and 1.129 m.daN).
(4)Install new packing (8), lubricated with Material No.P06-002, on union (6). Install union threads lubricated with Material No.P03-001, in valve (1). TORQUE union to between 115 and 130 lbf.in. (1.299 and 1.468 m.daN).
(5)Position valve (1) on bracket and install bolts (2), (3), threads lubricated with Material No.P03-001, and washers (4).TORQUE bolt (2) to between 50 and 70 lbf.in. (0.56 and 0.79 m.daN) and bolts (3) to between 50 and 70 lbf.in. (0.56 and 0.79 m.daN).
(6)Remove protective caps from three flex hose couplings.
(7)Connect flex hose (11), threads lubricated with Material No.P03-001, to union (5). TORQUE hose coupling to between 270 and 300 lbf.in. (3.05 and

3.389 m.daN).
(8) Connect flex hose (12), threads lubricated with Material No.P03-001, to union (7). TORQUE hose coupling to between 135 and 150 lbf.in. (1.525 and 1.694 m.daN).
(9) Connect flex hose (13), threads lubricated with Material No.P03-001, to union (6). TORQUE hose coupling to between 180 and 200 lbf.in. (2.033 and 2.259 m.daN).
(10) Remove protective caps from electrical connector and receptacle.
(11) Connect connector to receptacle and tighten connector coupling finger-tight plus one-eight turn.

D. Test
(1) Perform operational test (Ref. 78-32-11, P. Block 501).

E. Close-Up
(1) Make certain that working area is clean and clear of miscellaneous items of equipment.
(2) Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



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L-A131R (0604)

R Solenoid Operated Selector Valve
Figure 401

SOLENOID OPERATED SELECTOR VALVE - INSPECTION/CHECK

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
C.	Adapter Pin
D.	Force Gage, 0.5 lbs (0.23 Kg).
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-00, P. Block 401	Solenoid Operated Selector Valve

2. Procedure

A. Job Set-Up

R (1)Put a Warning Notice on the center pedestal to prohibit movement
R of the thrust reverser control levers in Reverse Idle position.
R (2)Open, safety and tag the circuit breakers, except 1KM and 2KM, and open fan cowl doors (Ref. 71-13-00, P. Block 301).

B. Procedure (Ref. Fig. 601)

NOTE : An adapter pin must be made perform the following procedure (Ref. Fig. 601).

(1)Check the force necessary to overcome the stow/solenoid magnet retention to cover the loss of stow solenoid energization.

NOTE : The test is performed with zero pressure applied to the solenoid.

(a)Make sure that there is electrical power to the selector valve solenoid.

(b)Disconnect Electrical plug DH15 from the selector valve solenoid (Ref. Fig. 601).

(c)Insert the adapter pin in the solenoid valve assembly vent hole as shown (Ref. Fig. 601).

(d)Lightly push on the adapter pin with a force gage that has the applicable adapter. The solenoid valve will either set to deploy or move back to stow, once the force is removed.

(e)Measure and record the force necessary to unseat the solenoid valve to stow position.

NOTE : When you measure the force necessary to unseat the solenoid, the adapter pin must be in line with the force gage. An incorrect reading will result if the adapter pin is not positioned correctly.

(f)Move the solenoid back to the stow position. Connect electrical plug DH15 to the selector valve solenoid.

(g)Do steps (b) through (f) at least three more times. Determine the average of the force measurements taken at step (e).

(h)The average force requirement is as follows :

1 For a non-serialized thrust reverser selector valve solenoid

with an old selector valve bracket assembly installed (Pre SB PW4NAC 78-93), the minimum acceptable stow position force (average) is 0.5 lbf (0.22 daN).

2 For a serialized thrust reverser selector valve solenoid with an old selector valve bracket assembly installed (Pre SB PW4NAC 78-93), the minimum acceptable stow position force (average) is 0.7 lbf (0.31 daN).

3 For a serialized thrust reverser selector valve solenoid with the new selector valve bracket assembly installed (Post SB PW4NAC 78-93), the minimum acceptable stow position force (average) is 0.7 lbf (0.31 daN).

(2)Check the force necessary to overcome the stow/solenoid magnet retention to cover the accidental energization of the deploy solenoid.

NOTE : The test is performed with zero pressure applied to the solenoid.

(a)Connect electrical plug DH15 to the solenoid.

(b)Make sure that there is electrical power to the selector valve solenoid.

(c)Insert the adapter pin in the solenoid valve assembly vent hole as shown (Ref. Fig. 601).

(d)Lightly push on the adapter pin with a force gage that has the applicable adapter.

(e)Measure and record the force necessary to overcome the stow magnet retention.

NOTE : When you measure the force necessary to overcome the stow magnet retention, the adapter pin must be in line with the force gage. An incorrect reading will result if the adapter pin is not positioned correctly.

(f)Do step (d) at least three times. Determine the average of the force measurements taken at step (d).

(g)The average force required to overcome the stow magnet retention must be a minimum of 3.2 lbf (1.42 daN). If the average force is less than the minimum, go to step (3).

(3)If the solenoid valve does not meet the on-wing check requirements, do as follows :

(a)Remove and replace the selector valve (Ref. 78-31-10, P. Block 401).

(b)Do the selector valve solenoid on-wing check again on the replacement solenoid.

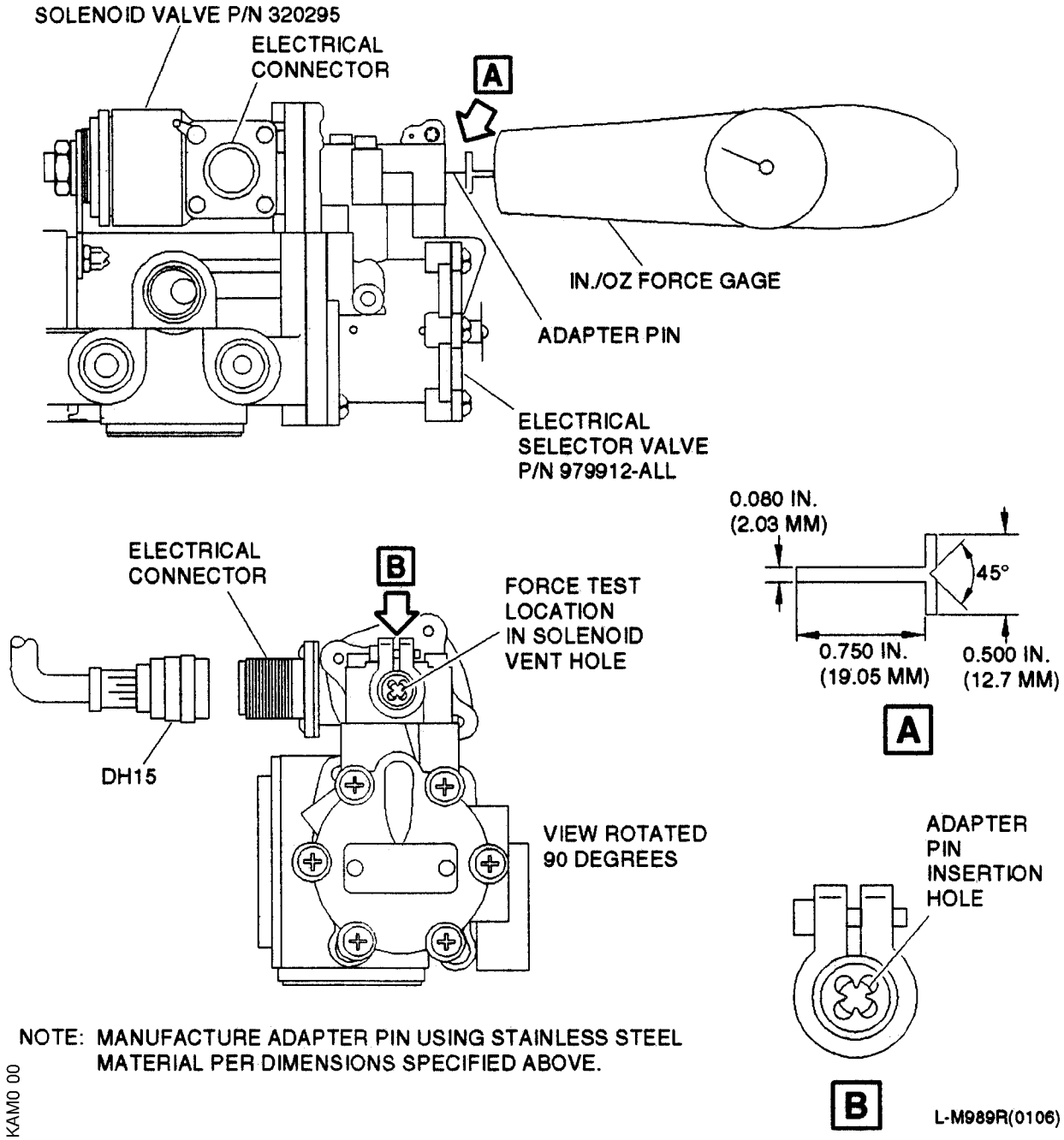
C. Close-Up

(1)Make certain that working area is clean and clear of miscellaneous items of equipment.

(2)Close fan cowl doors (Ref. 71-13-00, P. Block 301).

(3)Remove safety clips and tags and close circuit breakers.

R (4)Remove the Warning Notice from the center pedestal.



NOTE: MANUFACTURE ADAPTER PIN USING STAINLESS STEEL MATERIAL PER DIMENSIONS SPECIFIED ABOVE.

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Selector Valve Solenoid Force Measurement
Figure 601

FAN REVERSER FLEXIBLE SHAFT ASSY - REMOVAL/INSTALLATION

1. Main Drive Flexible Shaft

**ON A/C 101-200,

A. Equipment and Materials

ITEM	DESIGNATION
(1)	Access Platform
(2)	Circuit Breakers Safety Clips
(3)	Protective Covers
(4)Material No.P03-001	Oils (Ref. 70-00-00)
(5)Material No.P04-007	Common Greases (Ref. 70-00-00)
(6)Material No.P05-262	Special Materials (Ref. 70-00-00)
Referenced Procedures	
- 12-22-78, P. Block 001	Fan Thrust Reverser
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-00, P. Block 501	Thrust Reverser System Control
- 78-31-01, P. Block 401	Pneumatic Drive Unit
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

NOTE : These instructions apply to units that have synchronized shaft locks installed on the thrust reverser (Post SB PW4NAC A78-100).

B. Job Set-Up

(1)Open, safety and tag the appropriate circuit breakers and open LH fan cowl doors (Ref. 71-13-00, P. Block 301).

(2)Install access platform.

WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(3)Ensure ground air duct is not connected to air shutoff valve.

C. Remove Fan Reverser Main Drive Flexible Shaft (Ref. Fig. 401)

(1)Remove lower clamp (5) with screw (4), washer (3), and nut (6) attaching flexible shaft (1) to fan case.

(2)Remove five upper clamps (5) with screws (4) and washers (3) attaching flexible shaft (1) to fan case and clamp (5) attaching flexible shaft to TT2 sensor tubes.

(3)Remove lockwire, screws (2), and washers (3) securing upper end of flexible shaft to splitter gearbox.

(4)Remove lockwire, screws (2), and washers (3) securing lower end of flexible shaft to Pneumatic Drive Unit (PDU).

R (5)Remove flexible shaft (1) from fan case and place in a clean area.

Do not allow debris to contact flexible shaft.

(6)Inspect flexible shaft outer casing and inner core for wear. If
R wear is found, refer to Garrett/Allied Signal Fexible Shaft Assembly CMM 78-30-33 for allowable limits.

R (7)At PDU and splitter gearbox sides, inspect hex recess for wear. If wear
R is found, replace component as necessary.

(8)Inspect flexible shaft attach flange holes for wear, if worn or elongated, replace shaft.

(9)Secure flexible shaft inner core to housing to prevent separation of core from housing.

(10)Place flexible shaft in a clean area. Do not allow debris to contact flexible shaft.

R NOTE : For additional detailed maintenance information,
R see Flexible Shaft Assembly Component Maintenance Manual, 78-30-33 (Garrett/Allied Signal).

D. Install and Adjust Fan Reverser Main Drive Flexible Shaft
(Ref. Fig. 401)

(1)If PDU was removed (Ref. 78-31-01, P. Block 401) for installation instructions.

(2)Remove protective covers from flexible shaft (1) ends.

R (3)Inspect flexible shaft inner core and outer casing for lubrication. If lubrication is required (Ref. 12-22-78, P. Block 001).

NOTE : The ends of flexible shaft are interchangeable. It is required to apply a light coat of Grease (Material No.P04-007) to both end fittings of the flexible shaft before installation.

(4)Manually deploy translating sleeves to the nominal deploy position (Ref. 78-32-11, P. Block 201).

CAUTION : MAKE SURE THAT THE PDU HAS BEEN PNEUMATICALLY SET TO NOMINAL DEPLOY BEFORE INSTALLATION OF FLEXIBLE SHAFT. CHECK THAT THE LOCK IS ENGAGED.

(5)Position the flexible shaft (1) on the fan case. Attach the upper end of the flexible shaft to the splitter gearbox with screws (2) lubricated with Engine Oil (Material No.P03-001), and washers (3). TORQUE screws to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN) and safety with Lockwire (Material No.P05-262).

NOTE : The flexible shaft may be preloaded one-sixth turn (one hex flat) in the stow direction to permit engagement with PDU.

CAUTION : MAKE SURE THAT THE PDU HAS BEEN PNEUMATICALLY SET TO NOMINAL DEPLOY BEFORE INSTALLATION OF FLEXIBLE SHAFT. CHECK THAT THE LOCK IS ENGAGED.

(6)Attach the lower end of the flexible shaft in the PDU receptacle and install screws (2), lubricated with Engine Oil (Material No.P03-001) and washers (3) in flexible shaft end mounting plate. TORQUE screws to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN) and safety with Lockwire (Material No.P05-262).

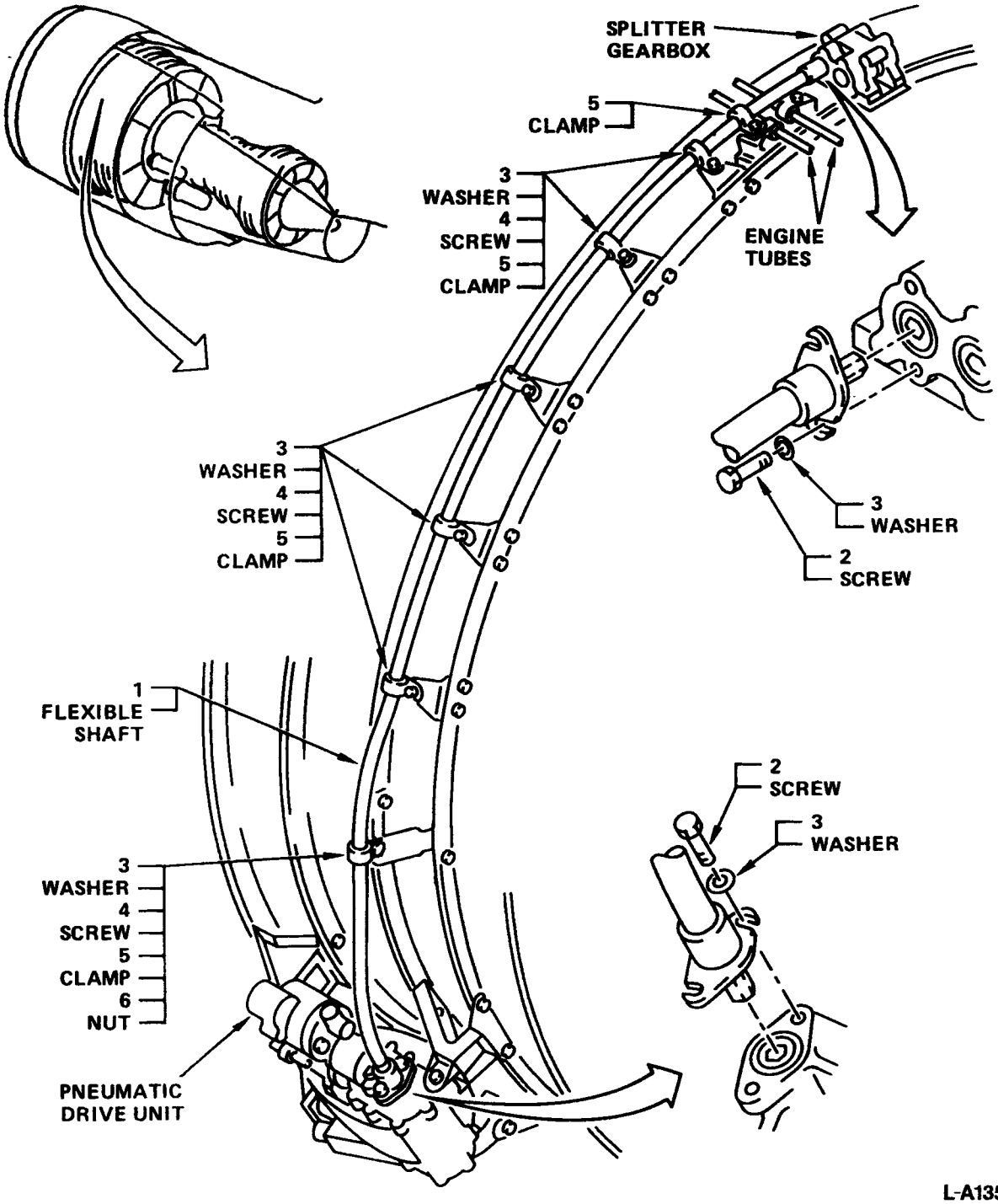
(7)Install five upper clamps (5) with screws (4) lubricated with Engine Oil (Material No.P03-001) and washers (3). Tighten screws finger tight.

R NOTE : Make sure the length of flexible shaft is evenly distributed between each clamping point.

(8)Attach the flexible shaft to TT2 sensor tube with clamp (5). Tighten

screws finger tight.
(9)Install lower clamp (5) with screw (4) lubricated with Engine Oil (Material No.P03-001), washer (3) and nut (6) finger tight.
(10)Torque screws and nuts on all clamps on flexible shaft.
(11)Manually stow translating sleeves (Ref. 78-32-11, P. Block 201).

E. Close-Up
(1)Manually translate thrust reverser sleeves to the stow position.
(2)Adjust Thrust Reverser Actuation System (Ref. 78-31-00, P. Block 501).
(3)Perform an operational test (Ref. 78-32-11, P. Block 501).
(4)Return the manual unlock lever of the synchronous shaft lock in normal position.
(5)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(6)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



Main Drive Flexible Shaft To PDU And Splitter Gearbox
Figure 401

R

**ON A/C 101-200,

2. Master Actuator Drive Flexible Shaft

A. Equipment and Materials

ITEM	DESIGNATION
(1)	Access Platform
(2)	Circuit Breakers Safety Clips
(3)	Protective Covers (Speed Tape or equivalent)
(4)Material No.P03-001	Oils (Ref. 70-00-00)
(5)Material No.P05-262	Special Materials (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-00, P. Block 501	Thrust Reverser System Control
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

B. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.
WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.
(3)Ensure ground air duct is not connected to air shutoff valve.

C. Removal (Ref. Fig. 402)
R NOTE : When both master and slave actuator flexible shafts must be
R removed, remove slave actuator flexible shafts first.
(1)Pre SB PW4NAC 78-107 (Ref. Fig. 402)(Sheet 1)
R (a)Remove clamps (13) and (16), bolt (5) and washer (9) attaching the master actuator flexible shaft (1) and upper slave actuator flexible shaft (2) to the bracket above the master actuator.
R NOTE : For W1/W2 option, remove clamps (13), bolt (8) and washer (9).
(b)Remove bolts (3), washers (10) and nuts (12) from guides. Remove the master actuator flexible shaft (1) from the guides.
(2)Post SB PW4NAC 78-107 (Ref. Fig. 403)
(a)Remove bolts (20) and clamps (21) securing master actuator flexible shaft to clip and bracket assemblies.
(b)Remove nuts (22), washers (23), screws (24) and bolts (25) from the guides.
(c)Push down on each guide as necessary to remove master actuator flexible shaft (1) from slot in guide.
(3)Remove bolts (4) and (6), washers (11), bracket (15) and guide (14) from

upper thrust reverser bulkhead.

(4)On W1/W2 option, remove screw (17), washer (9) and clamp (16) attaching the master actuator flexible shaft to the bracket on the thrust reverser bulkhead (Ref. Fig. 402)(Sheet 2).

(5)Remove bolts (5) and washers (9) attaching the master actuator flexible shaft (1) flanges to the splitter gearbox and the master actuator.

(6)Remove the master actuator flexible shaft (1) from the fan case and place it in a clean area. Do not allow debris to contact the flexible shaft.

(7)Inspect the flexible shaft outer casing and inner core for wear. If wear is found, see Garrett/Allied Signal Flexible Shaft Assembly CMM, 78-30-33 for allowable wear limits.

(8)At the splitter gearbox and master actuator sides, inspect hex recess for wear. If worn, replace component as necessary.

(9)Inspect the flexible shaft attach flange holes for wear. If worn or elongated, replace the flexible shaft.

(10)Secure the flexible shaft inner core to the housing to prevent separation of core from housing.

(11)Place the flexible shaft in a clean area. Do not allow debris to contact flexible shaft.

NOTE : For additional information concerning detailed maintenance of this component, see Flexible Shaft Assembly, (PN 121746-2, -3, -5) Component Maintenance Manual, 78-30-33 (Garrett/Allied Signal).

D. Installation (Ref. Fig. 402)

NOTE : The inner core can be rotated one-sixth turn (one hex flat) to allow insertion of flexible shaft.

(1)Inspect the core and casing of the master actuator flexible shaft (1) for lubrication. If lubrication is required, (Ref. 12-22-78, P. Block 001).

(2)Manually hold the actuators against the dog stops before inserting the flexible shaft into the master actuator(s) (Ref. Fig. 404).

(3)Apply a light coat of Grease (Material No.P04-007) to both end fittings of the master actuator flexible shaft (1).

(4)Remove the protective covers from the master actuator flexible shaft core. Install the master actuator flexible shaft (1) in the master actuator bore and attach with bolts (5) lubricated with Engine Oil (Material No.P03-001) and washers (9). TORQUE bolts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN) and safety with Lockwire (Material No. P05-262).

(5)Install the opposite end of the master actuator flexible shaft (1) in the splitter gearbox and attach with bolts (5) lubricated with Engine Oil (Material No.P03-001), and washers (9). TORQUE bolt to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN) and safety with Lockwire (Material No. P05-262).

(6)Pre SB PW4NAC 78-107 (Ref. Fig. 402)(Sheet 1)

(a)Attach the master actuator flexible shaft (1) and the upper slave actuator flexible shaft (2) to the bracket above the master actuator

R with clamps (16) and (13), bolt (5) lubricated with Engine Oil (Material No.P03-001), and washer (9). TORQUE bolt to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(b)Position the master actuator flexible shaft (1) in the guides above and below the slave actuator and install bolts (3) lubricated with Engine

Oil (Material No.P03-001), washers (10) and nuts (12). TORQUE nuts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

NOTE : Make sure the length of the flexible shaft is evenly distributed between each clamping point.

(7)Post SB PW4NAC 78-107 (Ref. Fig. 403)

(a)Install the master actuator flexible shaft (1) into the guides. Push down on the back of each guide as necessary to insert the master actuator flexible shaft (1) into the slot in the guide.

(b)Install screws (24), bolts (25), washers (23) and nuts (22) in the guides. TORQUE nuts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(c)Install clamps (21) on the master actuator flexible shaft (1) and attach to the clip assemblies and bracket assemblies with bolts (20). TORQUE the bolts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

NOTE : At one bracket location the master actuator flexible shaft (1) is butterfly clamped with upper slave actuator flexible shaft (2). Note the clamp position in (Ref. Fig. 403)(Sheet 2).

NOTE : Make sure the length of the flexible shaft is evenly distributed between each clamping point.

(8)Position the master actuator flexible shaft (1) in the guide (14) and the upper thrust reverser bulkhead. Install the guide and bracket (15) with bolts (4) and (6) lubricated with Engine Oil (Material No.P03-001), and washers (11). TORQUE bolts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(9)Align the master actuator flexible shaft (1) in the guide (14) on the upper thrust reverser bulkhead. Install the guide and bracket (15) with bolts (4) and (6) lubricated with Engine Oil (Material No.P03-001), and washers (11). TORQUE bolts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(10)On W1/W2 option, attach the master actuator flexible shaft (1) to the thrust reverser bulkhead with clamp (16), screw (17) and washer (9). TORQUE screw to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN) (Ref. Fig. 402)(Sheet 2).

E. Close-Up

(1)Manually translate thrust reverser sleeves to the stow position.

(2)Adjust Thrust Reverser Actuation System (Ref. 78-31-00, P. Block 501).

(3)Return the manual unlock lever of the synchronous shaft lock in normal position.

(4)Perform an operational test (Ref. 78-32-11, P. Block 501).

(5)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(6)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

**ON A/C 101-200,

3. Upper Slave Actuator Drive Flexible Shaft

A. Equipment and Materials

ITEM	DESIGNATION
(1)	Access Platform
(2)	Circuit Breakers Safety Clips
(3)	Protective Covers (Speed Tape or equivalent)
(4)Material No.P03-001	Oils (Ref. 70-00-00)
(5)Material No.P05-262	Special Materials (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-00, P. Block 501	Thrust Reverser System Control
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

B. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.
WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.
(3)Ensure ground air duct is not connected to air shutoff valve.

C. Removal (Ref. Fig. 402)
R NOTE : When both the master actuator and slave actuator flexible shafts
R must be removed, remove slave actuator flexible shafts first.
(1)Pre SB PW4NAC 78-107 (Ref. Fig. 402)(Sheet 1)
(a)Remove clamps (13), bolt (7) and washer (9) attaching the upper slave actuator flexible shaft (2) and the master actuator flexible shaft (1) to the bracket on the thrust reverser bulkhead.
(b)Remove clamps (13) and (16), bolt (5) and washer (9) attaching the upper slave actuator flexible shaft (2) and master actuator flexible shaft (1) to bracket above master actuator.
NOTE : For W1/W2 option, remove clamps (13), bolt (8) and washer (9) (Ref. Fig. 402)(Sheet 2).
(2)Post SB PW4NAC 78-107 (Ref. Fig. 403)
(a)Below slave actuator, remove bolt (20) and clamp (21) attaching slave actuator flexible shaft (2) to bracket assembly.
(b)Remove bolt (20) and clamps (21) attaching slave actuator flexible shaft (2) and master actuator flexible shaft (1) to the bracket

assembly.

(3)Remove lockwire, bolts (5) and washers (9) attaching the upper slave actuator flexible shaft (2) to the master and upper slave actuators. Remove the flexible shaft from the fan case.

CAUTION : TO PREVENT CONTAMINATION, INSPECT FLEXIBLE SHAFT IN A CLEAN WORK AREA.

(4)Inspect the flexible shaft outer casing and inner core for wear. If wear
R is found, refer to Garrett/Allied Signal Flexible Shaft Assembly CMM 78-30-33 for allowable wear limits

(5)Inspect the flexible shaft attach flange holes for wear, if worn or elongated, replace shaft.

(6)Secure flexible shaft inner core to the housing to prevent separation of core from housing.

(7)Place flexible shaft in a clean area. Do not allow debris to contact the flexible shaft.

(8)At the master actuator and upper slave actuator sides, inspect hex recess for wear. If worn, replace component as necessary.

R NOTE : For additional detailed maintenance information,
R see Flexible Shaft Assembly, (PN 121746-2, -3, -5) Component Maintenance Manual, 78-30-33 (Garrett/Allied Signal).

D. Installation (Ref. Fig. 402)

NOTE : The inner core can be rotated one-sixth turn (one hex flat) to allow insertion of flexible shaft.

NOTE : Hold the upper slave actuator in stow against its stops while installing flexible shaft.

NOTE : Apply a light coat of Grease (Material No.P04-007) to both end fittings of the upper slave actuator flexible shaft (2) before installation.

(1)Remove the protective cover from the upper slave actuator flexible shaft core. Install upper slave actuator flexible shaft (2) flanges on the upper slave actuator and master actuator with bolts (5) lubricated with Engine Oil (Material No.P03-001) and washers (9). TORQUE bolts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN) and safety with Lockwire (Material No.P05-262).

(2)Pre SB PW4NAC 78-107 (Ref. Fig. 402)(Sheet 1)

(a)Attach the upper slave actuator flexible shaft (2) and the master actuator flexible shaft (1) to the bracket above the master actuator
R with clamps (13) and (16), bolt (5) lubricated with Engine Oil (Material No.P03-001) and washer (9). TORQUE bolt to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

NOTE : For W1/W2 option, install clamps (13), bolt (8) and washer (9) (Ref. Fig. 402)(Sheet 2).

NOTE : Make sure the length of the flexible shaft is evenly distributed between each clamping point.

(b)Attach the upper slave actuator flexible shaft (2) to the bracket below the slave actuator with clamp (13), bolt (7) lubricated with Engine Oil (Material No.P03-001) and washer (9). TORQUE nuts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(3)Post SB PW4NAC 78-107 (Ref. Fig. 403).

(a)Attach the upper slave actuator flexible shaft (2) and the master actuator flexible shaft (1) to the bracket above the master actuator with clamps (21), bolt (20) lubricated with Engine Oil (Material No. P03-001) and washer (9). TORQUE bolt to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

NOTE : Make sure the length of the flexible shaft is evenly distributed between each clamping point.

(b)Attach the upper slave actuator flexible shaft (2) to the bracket below the upper slave actuator with clamp (21), bolt (20) lubricated with Engine Oil (Material No.P03-001) and washer (9). TORQUE bolt to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

E. Close-Up

(1)Manually translate thrust reverser sleeves to the stow position.

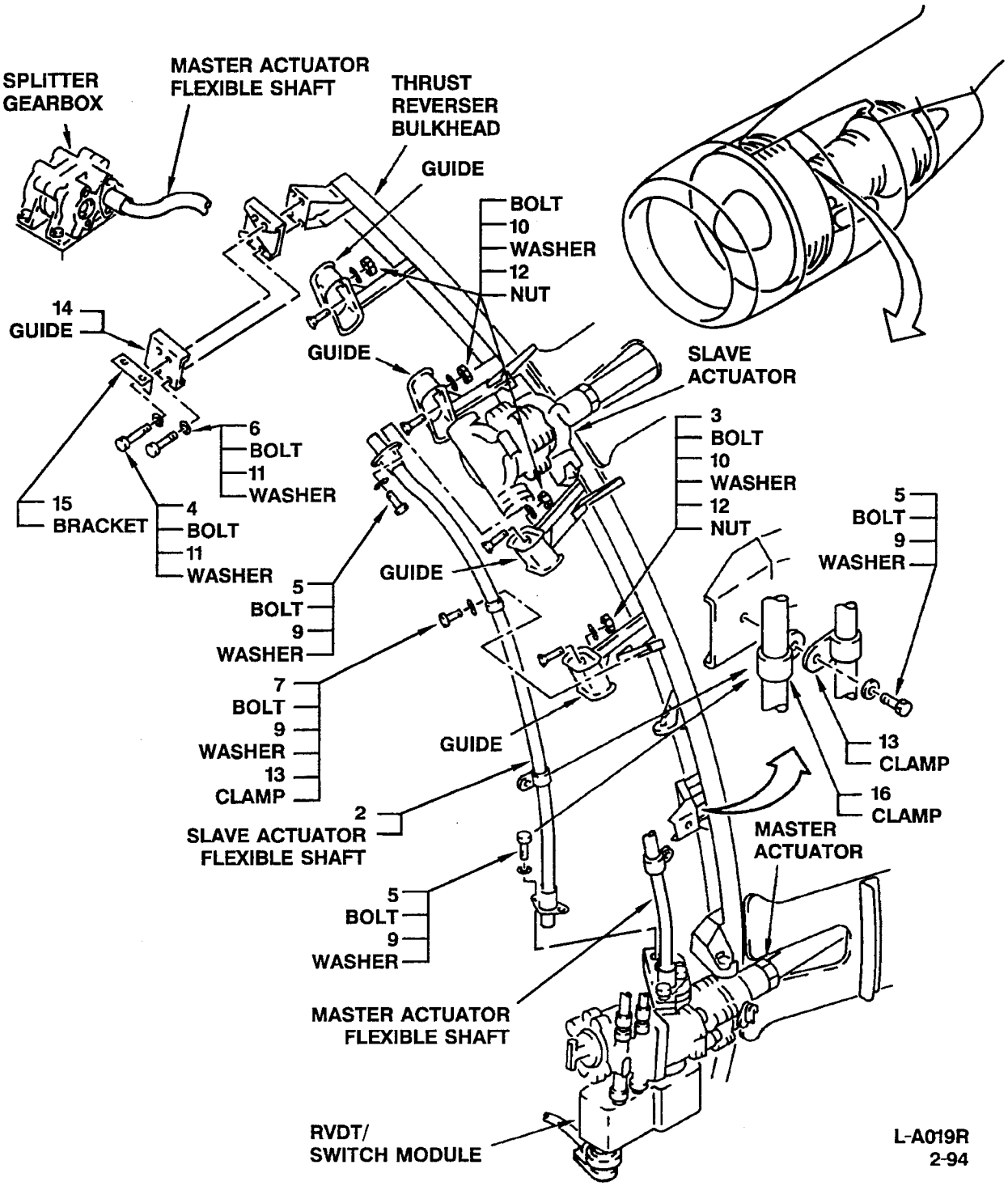
(2)Adjust Thrust Reverser Actuation System (Ref. 78-31-00, P. Block 501).

(3)Return the manual unlock lever of the synchronous shaft lock in normal position.

(4)Perform an operational test (Ref. 78-32-11, P. Block 501).

(5)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

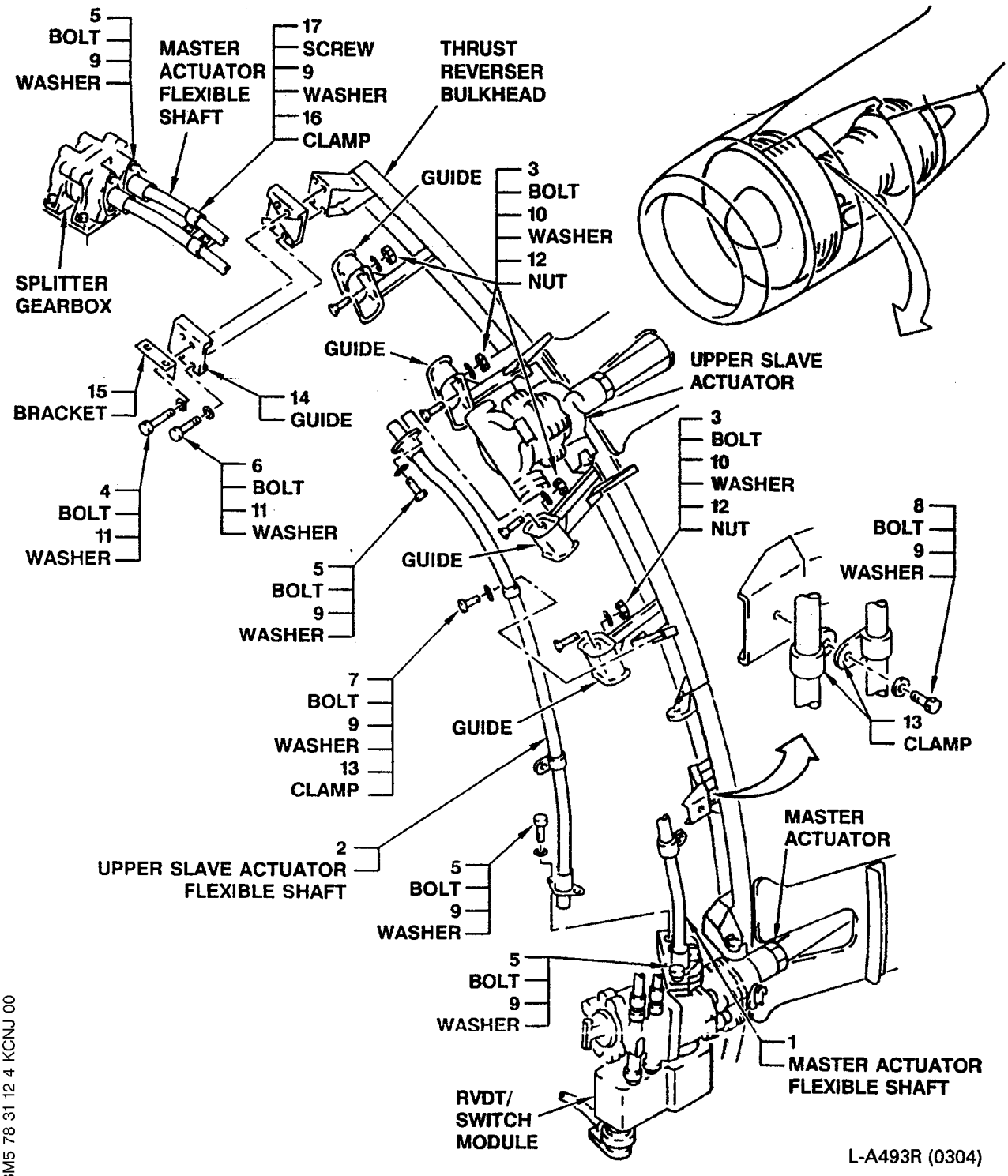
(6)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



BM5 78 31 12 4 KCNA 00

Master Actuator Flexible Shafts To Splitter Gearbox And Upper Slave Actuator (Sheet 1/2)
Figure 402

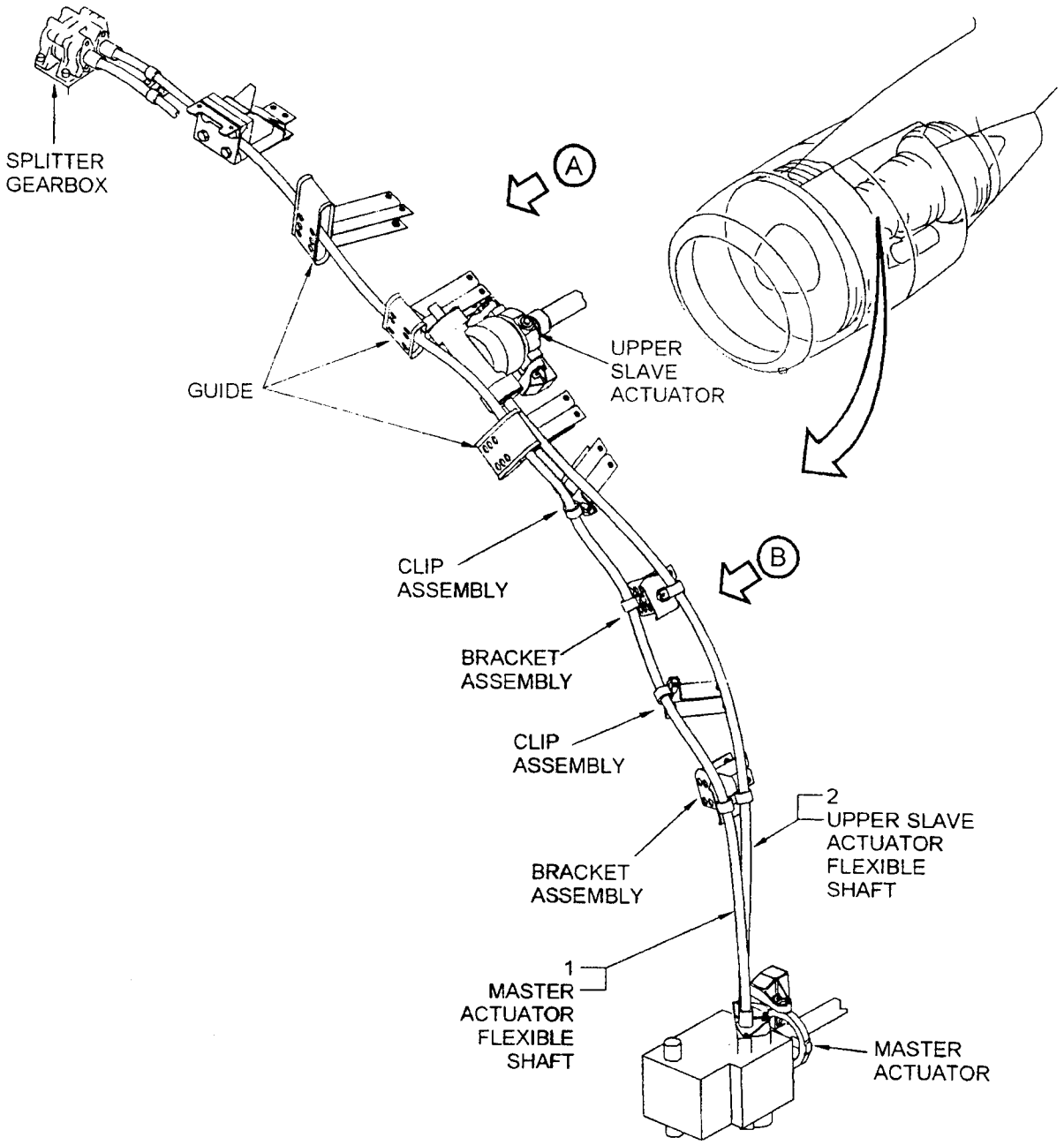
R



BM5 78 31 12 4 KCNJ 00

Master Actuator Flexible Shafts To Splitter Gearbox And Upper Slave Actuator W1/W2 Option (Sheet 2/2)
Figure 402

R

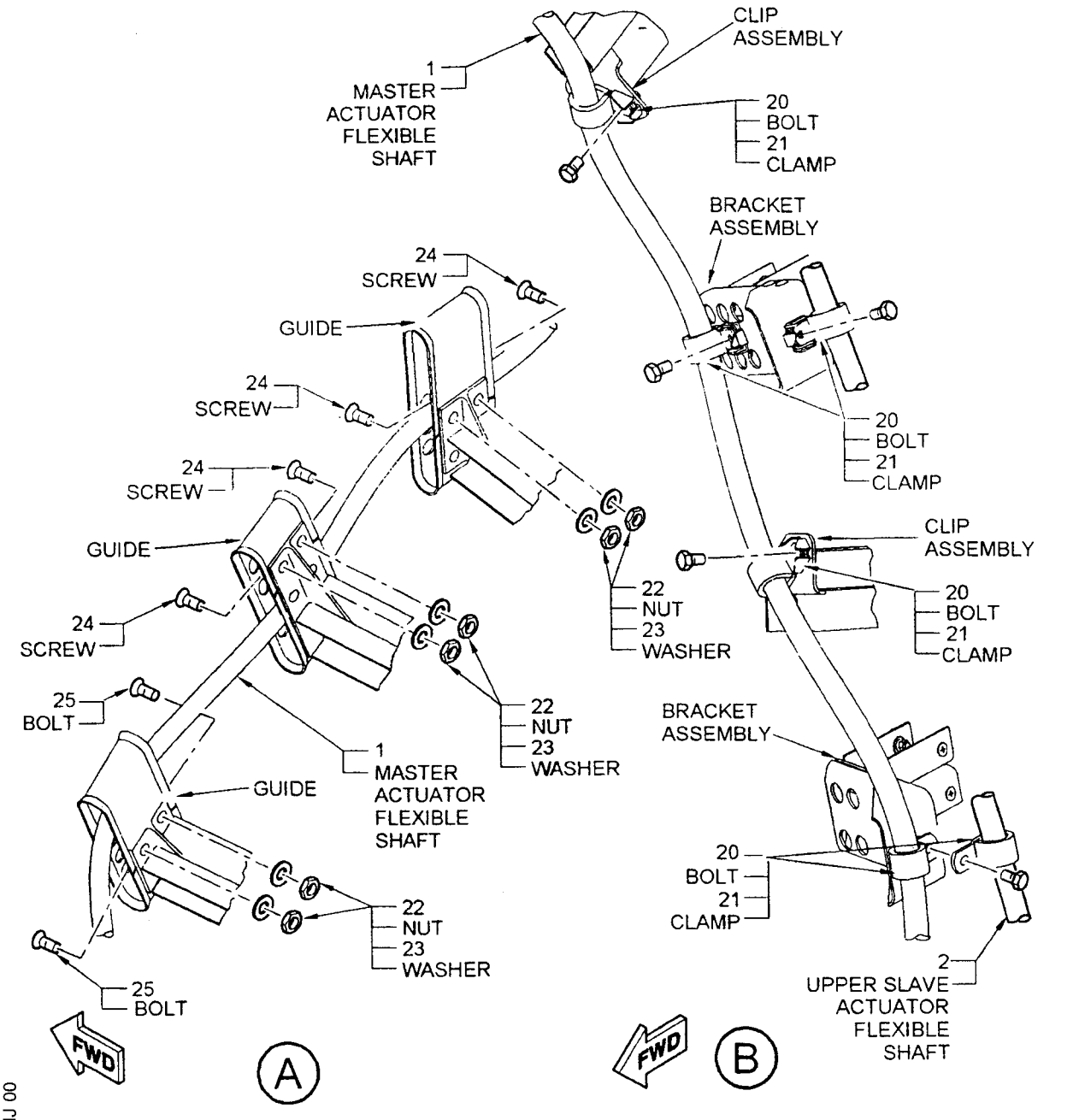


L-A510R (1004)

BM5 78 31 12 4 KGMA 00

Master Actuator Flexible Shafts To Splitter Gearbox And Upper Slave Actuator Post SB PW4NAC 78-107 (Sheet 1/2)
Figure 403

R

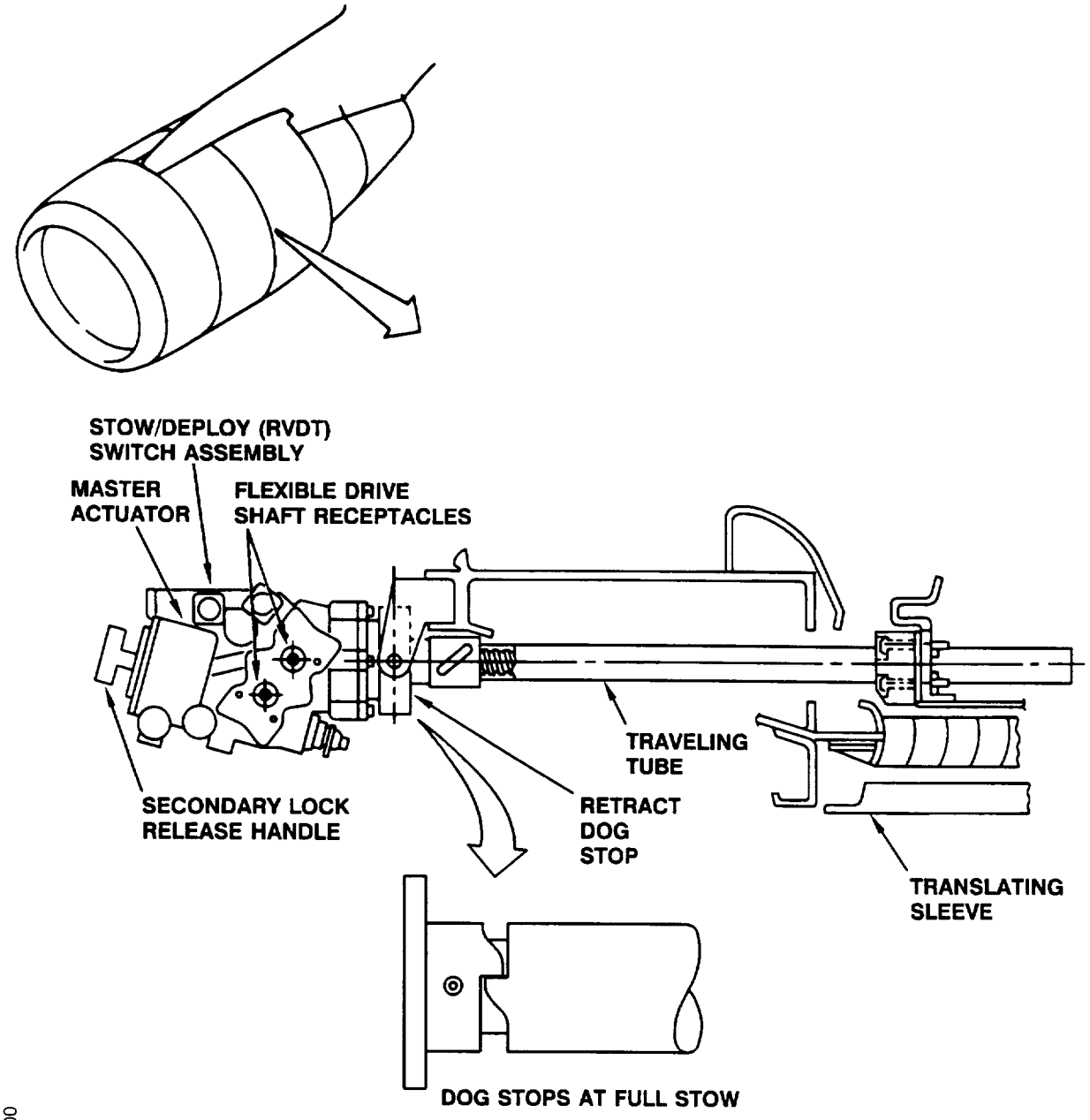


L-A511R(1004)

BM5 78 31 12 4 KGMJ 00

Master Actuator Flexible Shafts To Splitter Gearbox And Upper Slave Actuator Post SB PW4NAC 78-107 (Sheet 2/2)
Figure 403

R



BM5 78 31 12 4 KHM0 00

Dog Stops at Full Stow
Figure 404

**ON A/C 101-200,

4. Lower Slave Actuator Drive Flexible Shaft

A. Equipment and Materials

ITEM	DESIGNATION
(1)	Access Platform
(2)	Circuit Breakers Safety Clips
(3)	Protective Covers (Speed Tape or equivalent)
(4)Material No.P03-001	Oils (Ref. 70-00-00)
(5)Material No.P05-262	Special Materials (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-00, P. Block 501	Thrust Reverser System Control
- 78-31-41, P. Block 401	Synchronous Shaft Lock Assembly
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

B. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers.
(2)Open the fan cowl door (Ref. 71-13-00, P. Block 301).
WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE REMOVING OR INSTALLING THRUST REVERSER SYNCHRONOUS SHAFT LOCK ASSEMBLY AND FLEXIBLE SHAFTS. DO NOT ATTEMPT TO MANUALLY MOVE SLEEVES WHEN AN AIR SUPPLY IS CONNECTED TO PNEUMATIC DRIVE UNIT (PDU). A POWER SURGE COULD CAUSE SERIOUS INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

C. Removal (Ref. Fig. 405)
(1)Remove the flexible shaft (8) between the synchronous shaft lock assembly and lower slave actuator as follows :
NOTE : The following instructions apply to both left and right hand installations, except as noted.
(a)Make sure thrust reverser assembly is fully stowed.
(b)Make sure both master actuator locks and PDU lock handles are engaged.
(c)Disconnect electrical connector DH17 (LH) or DH16 (RH) from receptacle on synchronous shaft lock assembly.
R (d)(Pre SB PW4NAC 78-120) Remove clamp (9), bolt (10) and washer (11) attaching the lower flexible shaft (8) to the clamp support.
R (e)(Post SB PW4NAC 78-120) Remove clamp (18), bolt (19) and washers (20) and nuts (21) that attach the lower flexible shaft (8) to the clamp support bracket.
R (f)Remove lockwire, bolts (12) and washers (13) attaching the lower flexible shaft (8) to the lower slave actuator and synchronous shaft lock assembly. Remove the lower flexible shaft.

R (g)Install protective cover on the orifice of the lower slave actuator and in synchronous shaft lock assembly bore to prevent contamination.
CAUTION : TO PREVENT CONTAMINATION, INSPECT FLEXIBLE SHAFT IN A CLEAN WORK AREA.

R (h)Inspect the lower flexible shaft (8) outer casing and inner core for wear. If wear is found, refer to Garrett/Allied Signal CMM 78-30-33 for allowable limits.

R (i)Inspect lower flexible shaft (8) attachment flange holes for wear. If worn or elongated, replace flexible shaft.

(j)Secure the lower flexible shaft (8) inner core to the housing to prevent separation from the housing.

(k)Place the flexible shaft in a clean area. Do not allow debris to contact flexible shaft.

(l)At the lower slave actuator and lock sides, inspect hex recess for wear. If worn, replace the component as necessary.

(2)Remove flexible shaft (1) between synchronous shaft lock assembly and master actuator as follows :
NOTE : The following instructions apply to both left and right hand installations, except as noted.

(a)Make sure thrust reverser assembly is fully stowed.

(b)Make sure both master actuator locks and PDU lock handles are engaged.

(c)Disconnect the DH17 (LH) or DH16 (RH) electrical connector from receptacle on synchronous shaft lock assembly.

(d)Remove lockwire, bolts (12) and washers (13) that attach upper flexible shaft (1) to the master actuator and synchronous shaft lock assembly.
CAUTION : REMOVAL OF SYNCHRONOUS SHAFT LOCK ASSEMBLY FROM SUPPORT BRACKET IS REQUIRED TO PROPERLY DISENGAGE UPPER FLEXIBLE SHAFT (1) INSTALLED BETWEEN MASTER ACTUATOR AND SYNCHRONOUS SHAFT LOCK ASSEMBLY. FAILURE TO REMOVE SYNCHRONOUS SHAFT LOCK ASSEMBLY MAY RESULT IN PERMANENT DAMAGE TO FLEXIBLE SHAFT OR OTHER COMPONENTS.

(e)Loosen and remove bolts (14) that attach synchronous shaft lock assembly to support bracket. Carefully support synchronous shaft lock assembly.

(f)Loosen and remove bolts (15), washers (16) and nuts (17) that attach synchronous shaft lock assembly to support bracket. Carefully support synchronous shaft lock assembly.

(g)Retract upper flexible shaft (1) from master actuator drive port.

(h)Retract upper flexible shaft (1) from synchronous shaft lock assembly. Make sure flexible shaft core remains inside housing. Remove upper flexible shaft.

(j)At the master actuator and lock sides, inspect the hex recess for wear. If worn, replace the component as necessary.
CAUTION : TO PREVENT CONTAMINATION, INSPECT FLEXIBLE SHAFT IN A CLEAN WORK AREA.

(k)Inspect the upper flexible shaft (1) outer casing and the inner core for wear. If wear is found, refer to Garrett/Allied Signal Flexible Shaft Assembly CMM, 78-30-33 for allowable wear limits.

(l)Inspect the upper flexible shaft (1) attachment flange holes for wear. If worn or elongated, replace the flexible shaft.

(m)Secure the upper flexible shaft (1) inner core to the housing to

prevent separation from the housing.

(n)Place the flexible shaft in a clean area. Do not allow debris to contact the flexible shaft.

NOTE : For additional detailed maintenace information of the component, see Flexible Shaft Assembly, (PN 121746-2, -3, -5) Component Maintenance Manual, 78-30-33 (Garrett/Allied Signal).

D. Installation (Ref. Fig. 405)

(1)Install the flexible shaft (1) between the synchronous shaft lock assembly and master actuator as follows :

(a)Apply a light coat of Grease (Material No.P04-007) to both ends of the upper flexible shaft before installation.

(b)Remove protective covers from master actuator and synchronous shaft lock assembly. Lightly apply Lubricating Oil (Material No.P03-014) to synchronous shaft lock assembly bore.

(c)Position synchronous shaft lock assembly lever in UNLOCKED position (lever points outboard).

CAUTION : THE SYNCHRONOUS SHAFT LOCK ASSEMBLY MUST BE REMOVED FROM SUPPORT BRACKET TO PROPERLY ENGAGE FLEXIBLE SHAFT BETWEEN MASTER ACTUATOR AND SYNCHRONOUS SHAFT LOCK ASSEMBLY. FAILURE TO REMOVE SYNCHRONOUS SHAFT LOCK ASSEMBLY MAY RESULT IN PERMANENT DAMAGE.

(d)Remove synchronous shaft lock assembly (Ref. 78-31-41, P. Block 401).

R (e)Install upper flexible shaft (1) into synchronous shaft lock assembly bore. Seat inner rod portion of flexible shaft flush against bottom of the bore. Push metal sheathing of flexible shaft down, over the inner rod. Attach attach flange of upper flexible to synchronous shaft lock assembly with bolts (12) lubricated with Engine Oil (Material No. P03-001) and washers (13). Do not torque bolts at this time.

R (f)Install opposite end of upper flexible shaft (1) into master actuator bore. Attach flexible shaft attach flange to master actuator with bolts (12) lubricated with Engine Oil (Material No.P03-001) and washers (13). Do not torque bolts at this time.

R (g)Install synchronous shaft lock assembly (Ref. 78-31-41, P. Block 401).

R (h)After flexible shaft and synchronous shaft lock assembly are installed, TORQUE previously installed flexible shaft attach flange bolts (12) to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

R (i)Connect DH17 (LH) or DH16 (RH) electrical connector to receptacle on synchronous shaft lock assembly. Hand tighten connector coupling nut. Then use soft-jawed connector pliers to turn coupling nut an additional one-eighth turn.

(2)Install flexible shaft (8) between synchronous shaft lock assembly and lower slave actuator as follows :

(a)Apply a light coat of Grease (Material No.P04-007) to both ends of the upper flexible shaft before installation.

(b)Remove protective covers from lower slave actuator and synchronous shaft lock assembly. Lightly apply Lubricating Oil (Material No. P03-014) to synchronous shaft lock assembly bore.

(c)Position synchronous shaft lock assembly lever in UNLOCKED position (lever points outboard).

(d)Install lower flexible shaft (8) into synchronous shaft lock assembly bore. Attach flexible shaft attach flange of bottom of synchronous shaft lock assembly with bolts (12) lubricated with Engine Oil (Material No.P03-001) and washers (13). Do not torque bolts at this time.

(e)Install opposite end of lower flexible shaft (8) into lower slave actuator bore. Attach flexible shaft attach flange with bolts (12) lubricated with Engine Oil (Material No.P03-001) and washers (13).

(f)After lower flexible shaft (8) is installed, torque four lower flexible shaft attach flange bolts (12). TORQUE to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

R (g)(Pre SB PW4NAC 78-120) Attach lower flexible shaft to clamp support bracket using a clamp (9), bolt (10) and washer (11). TORQUE bolt to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

R (h)(Post SB PW4NAC 78-120) Attach the lower flexible shaft to the clamp support bracket using clamp (18), bolt (19) and two washers (20) and nut (21). TORQUE nut to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

R (i)Connect DH17 (LH) or DH16 (RH) electrical connector to receptacle on synchronous shaft lock assembly. Hand tighten connector coupling nut. Then use soft-jawed connector pliers to turn coupling nut an additional one-eighth turn.

E. Close-Up

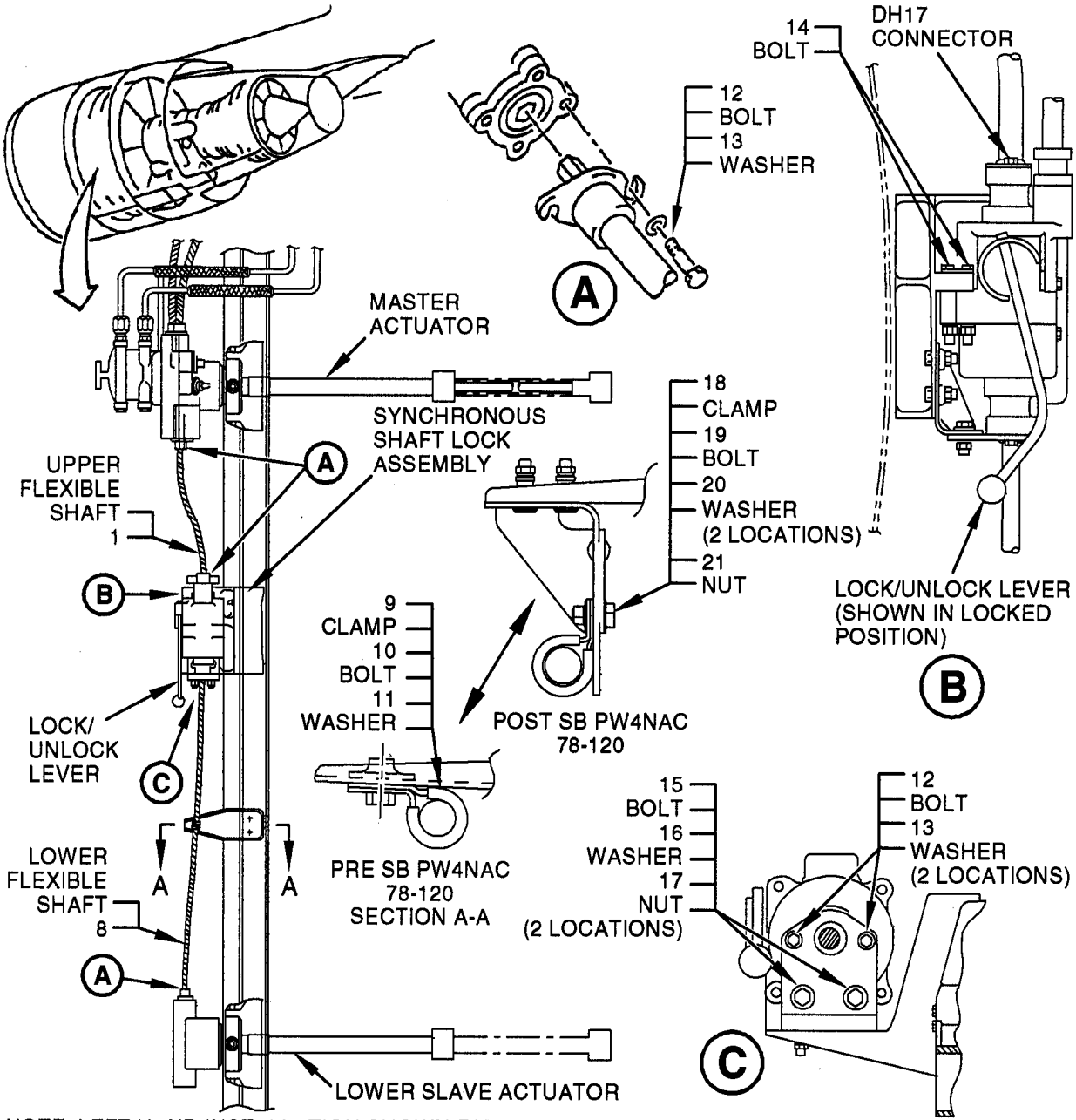
(1)Manually translate thrust reverser sleeves to the stow position.

(2)Adjust Thrust Reverser Actuation System (Ref. 78-31-00, P. Block 501).

(3)Perform an operational test (Ref. 78-32-11, P. Block 501).

(4)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(5)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



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R Flexible Shaft Master/Lower Slave Actuator
Figure 405

MASTER AND SLAVE ACTUATORS - MAINTENANCE PRACTICES

1. Equipment and Materials

ITEM	DESIGNATION
A.	Torque Wrench
B. Material No.P05-262	Special Materials (Ref. 70-00-00)
C. Material No.P09-002	Sealants (Ref. 70-00-00)
D.	Hex, Wrench, 3.8 in. (9.5 mm)
Referenced Procedures	
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-31-15, P. Block 401	Master and Slave Actuator
- 71-13-00, P. Block 301	Cowl Doors

2. Adjust Master and Slave Actuators
(Ref. Fig. 201)

**ON A/C 101-200,

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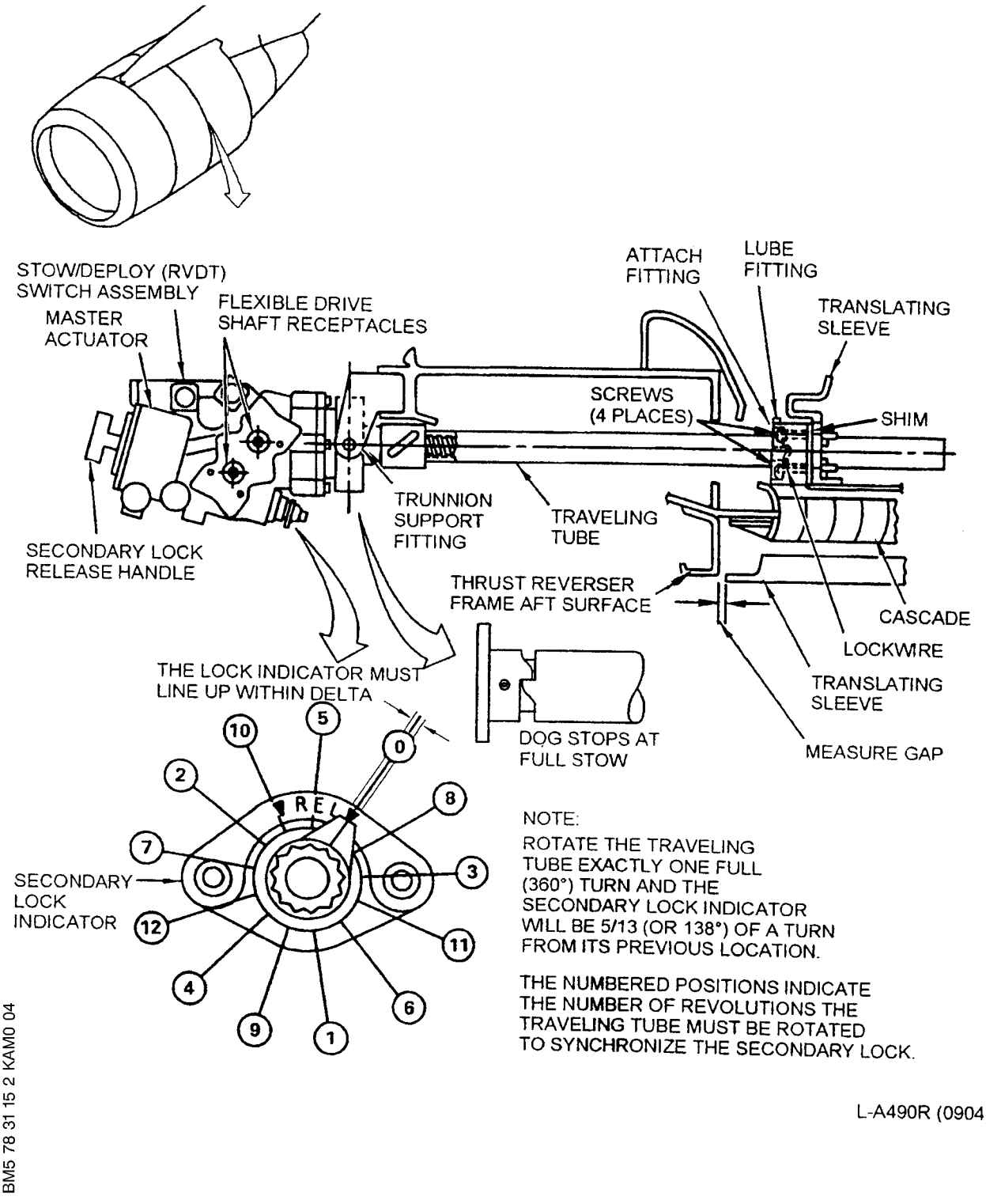
NOTE : Following procedure applies to all three actuators for each thrust reverser translating sleeve.

A. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.
(3)Ensure that ground air duct is not connected to ground operation air transfer pneumatic valve.

B. Check Gap - Translating Sleeve To Thrust Reverser Frame
(Ref. Fig. 201)
CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCK POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER SYSTEM.
(1)Manually stow translating sleeve (Ref. 78-32-11, P. Block 201).
(2)Measure gap, adjacent to each actuator, between translating sleeve forward edge and thrust reverser frame aft surface. The allowable gap is 0.09 to 0.15 in. (2.29 to 3.81 mm). Adjust the gap as necessary.
NOTE : The allowable gap dimension is different when pneumatic pressure is applied.

C. Adjust Gap - Translating Sleeve To Thrust Reverser Aft Frame
(Ref. Fig. 201)
CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCK POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST


STOW/DEPLOY (RVDT) SWITCH ASSEMBLY
MASTER ACTUATOR
FLEXIBLE DRIVE SHAFT RECEPTACLES
ATTACH FITTING
LUBE FITTING
TRANSLATING SLEEVE
SCREWS (4 PLACES)
SHIM
TRUNNION SUPPORT FITTING
TRAVELING TUBE
SECONDARY LOCK RELEASE HANDLE
THRUST REVERSER FRAME AFT SURFACE
CASCADE
LOCKWIRE
TRANSLATING SLEEVE
THE LOCK INDICATOR MUST LINE UP WITHIN DELTA
DOG STOPS AT FULL STOW
MEASURE GAP
REL
SECONDARY LOCK INDICATOR
NOTE:
ROTATE THE TRAVELING TUBE EXACTLY ONE FULL (360°) TURN AND THE SECONDARY LOCK INDICATOR WILL BE 5/13 (OR 138°) OF A TURN FROM ITS PREVIOUS LOCATION.
THE NUMBERED POSITIONS INDICATE THE NUMBER OF REVOLUTIONS THE TRAVELING TUBE MUST BE ROTATED TO SYNCHRONIZE THE SECONDARY LOCK.
L-A490R (0904)
BM5 78 31 15 2 KAM0 04

R Actuator Adjustment
Figure 201

REVERSER SYSTEM.

(1)Manually deploy translating sleeve (Ref. 78-32-11, P. Block 201).
(2)Remove lockwire and remove four screws attaching each actuator attach fitting and shim to translating sleeve.
CAUTION : FAILURE TO PREVENT ROTATION OF SLEEVE ATTACH FITTING WILL RESULT IN DESYNCHRONIZING THE SECONDARY LOCK FUNCTION.
(3)While retaining traveling tube to prevent its rotation, manually retract actuator enough to remove shims.
(4)Add or subtract shims or peel existing shims as necessary to obtain allowable gap. Reinstall shim.
NOTE : Each shim layer is 0.002 in. (0.05 mm) thick.
(5)Position shim to actuator attach fitting. Retain traveling tube and manually extend actuator to lightly contact translating sleeve.
(6)Install four screws to secure actuator attach fitting and shim to translating sleeve.
(7)Manually drive translating sleeve to fully stowed (retracted) position (Ref. 78-32-11, P. Block 201).
NOTE : At the fully stowed position, the actuator dog stops are in contact. (Ref. Fig. 201)
(8)Check gap per Paragraph B. If gap measurements are acceptable, apply Material No.P09-002 to screw threads and TORQUE to between 50 and 70 lbf.in. (0.56 and 0.79 m.daN). Lockwire screws with (Material No.P05-262). If gap does not meet required measurement, readjust actuator per paragraph C.

D. Check Torque Required To Deploy And Stow Translating Sleeve
CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCK POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER SYSTEM.
(1)Fully stow translating sleeves manually (Ref. 78-32-11, P. Block 201).
NOTE : At the fully stowed position, the actuator dog stops are in contact. (Ref. Fig. 201)
(2)Extend master actuator secondary lock release handle and retain handle in unlock position.
(3)Using torque wrench with 3/8 in. socket in master actuator recessed drive, slowly extend the both sleeves assembly. At three distances along the stroke, approximately 1, 10, and 20 in. (25.4, 254 and 508 mm), measure the torque input. TORQUE required to move sleeve must not exceed 25 lbf.in. (0.28 m.daN).
(4)Drive translating sleeve toward stow position and measure torque required to move sleeve. Measure torque required to seat sleeve against stow seals. TORQUE is not to exceed 25 lbf.in. (0.28 m.daN) for any movement requirement.
(5)If torque exceeds specified limit refer to appropriate fault isolation procedure.

E. Resynchronize Master Actuator Secondary Lock
CAUTION : IF THE RVDT-SWITCH ASSEMBLY HAS BEEN PREVIOUSLY INSTALLED ON THE MASTER ACTUATOR, IT MUST BE REMOVED BEFORE RESYNCHRONIZING THE SECONDARY LOCK. THE RVDT MUST BE REINSTALLED AFTER COMPLETION OF

RESYNCHRONIZATION.
AT FULL STOW THERE ARE 13 POSSIBLE LOCATIONS OF THE SECONDARY LOCK POSITION INDICATOR. (Ref. Fig. 201) THE CORRECT FULL STOW POSITION OF THE INDICATOR IS POSITION 0 (ZERO).

CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCK POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER SYSTEM.

(a)Fully stow translating sleeves manually (Ref. 78-32-11, P. Block 201).
NOTE : At the fully stowed position, the actuator dog stops are in contact. (Ref. Fig. 201)
(b)Note the position of the secondary lock indicator. (Ref. Fig. 201).
CAUTION : DO NOT ALLOW TRAVELING TUBE TO ROTATE AS THE ACTUATOR IS EXTENDING.
(c)Using a 3/8 in. hex wrench inserted into the actuator drive input, extend the actuator 4 and 5 in. (101.6 and 127.0 mm).
NOTE : If the actuator is not attached to the sleeve, do not allow the traveling tube to rotate as the actuator is extended. If the master actuator has been previously rigged, disconnect the slave actuator flex shafts and remove the sleeve attach fitting from the sleeve after the actuator has been extended.
(d)Rotate the traveling tube, in the retract direction, 360 degrees (one full revolution), the number identified in step (b).
For exemple : If the indicator is pointing toward the number 7, rotate the tube seven complete revolutions.
CAUTION : DO NOT ALLOW TRAVELING TUBE TO ROTATE AS THE ACTUATOR IS RETRACTING.
(e)Using a 3/8 in. hex drive inserted into the drive input, retract the master actuator to the fully stowed position.
(f)Note the position of the secondary lock indicator. (Ref. Fig. 201)
(g)If the indicator is not pointing toward 0 (zero), repeat steps (c) thru (f).
(h)If the indicator is pointing toward 0 (zero), within the delta as shown in (Ref. Fig. 201), the secondary lock is correctly synchronized and the master actuator can be rigged (Ref. 78-31-15, P. Block 401).

F. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Remove access platform.
(3)Close fan cowl doors (Ref. 71-13-00, P. Block 301).
Remove safety clips and tags and close circuit breakers.

MASTER AND SLAVE ACTUATORS - REMOVAL/INSTALLATION

1. General

This procedure contains instructions to remove and install both the master and slave actuator. Each procedure is written so as to allow either actuator to be removed or installed independent of the other.

2. Equipment and Materials

ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breaker Safety Clips
C.	Torque Wrench
D.	Packing
E.	Lockwire (MS 20995C32) (Ref. 70-00-00)
F.	Protective Covers
G. Material No.P03-001	Oils (Ref. 70-00-00)
H. Material No.P09-002	Compound (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-12, P. Block 401	Fan Reverser Flexible Shaft Assy
- 78-31-15, P. Block 201	Master and Slave Actuator
- 78-31-15, P. Block 601	Master and Slave Actuator
- 78-31-40, P. Block 401	Stow Deploy RVDT Switch Assy
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 401	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves
- 78-32-12, P. Block 401	Thrust Reverser Cascades

3. Master Actuator Removal/Installation Procedure

**ON A/C 101-200,

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A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

PANEL	SERVICE	IDENT.	LOCATION
FOR ENGINE 1			
133VU	ENGINES/ENG1 REVERSE WARN	3KM	332/U68
FOR ENGINE 2			
133VU	ENGINES/ENG2 REV WARN	4KM	331/V73

(2)Open fan cowl doors (Ref. 71-13-00, P. Block 301).

CAUTION : TO PREVENT BINDING, ENSURE THRUST REVERSER DOORS ARE LOWERED AND LATCHES LOCKED BEFORE DEPLOYING TRANSLATING SLEEVES.

(3)Ensure thrust reverser doors are completely closed and latches locked (Ref. 71-13-00, P. Block 301).

NOTE : Actuators are accessed by manually translating sleeve to fully deployed position and removing adjacent cascades as described in removal procedures.

WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(4)Ensure that ground air duct is not connected to ground operation air transfer pneumatic valve.

CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCK POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER SYSTEM.

(5)Manually unlock the synchronous shaft lock assembly.

(6)Disconnect flexible shaft between splitter gearbox and master actuator at actuator (Ref. 78-31-12, P. Block 401).

NOTE : Actuator rigging for left and right hand reversers may be performed independently of one another.

**ON A/C 101-200,

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B. Remove master actuator (Ref. Fig. 401).

CAUTION : REMOVE THE RVDT AND STOW DEPLOY SWITCH ASSEMBLY AS A UNIT. DO NOT SEPARATE THE RVDT FROM THE STOW DEPLOY SWITCH ASSEMBLY.

(1)Remove RVDT and Stow Deploy Switch Assembly. (Ref. 78-31-40, P. Block 401).

(2)Remove electrical connector (DS302 or DS306).

(3)Disconnect sensor tubes at master actuator.

(4)Install protective covers on sensor tubes.

(5)Remove unions, packings and plug from actuator. Discard packings.

(6)Remove two bolts attaching cover plate to master actuator. Remove and retain cover for re-installation.

(7)Using 3/8 inch hex wrench in master actuator hex drive, manually drive translating sleeve to fully deployed position (Ref. 78-32-11, P. Block 201).

CAUTION : IF MORE THAN ONE CASCADE AT A TIME PER THRUST REVERSER HALF IS REMOVED, A GAP CHECK IS REQUIRED BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND AFT CASCADE SUPPORT FRAME AT CASCADE INSTALLATION (REF. 78-32-16, P. BLOCK 401 FOR DETAILED GAP CHECK PROCEDURE).

(8)Remove two cascades adjacent to master actuator to gain access to master actuator attach fitting (Ref. 78-32-12, P. Block 401).

(9)Using 3/8 inch hex wrench in master actuator hex drive, manually drive translating sleeve towards stow position to allow sufficient access to four screws attaching actuator attach fitting and shim to translating

sleeve. (130 turns of hex wrench from deploy toward stow or a gap of 14.56 inch (370 mm) between translating sleeve forward edge and thrust reverser aft frame) (Ref. 78-31-15, P. Block 201).

(10)Post SB PW4NAC 78-71, remove lockwire. Pre and Post SB PW4NAC 78-71, remove four screws attaching actuator attach fittings and shim to translating sleeve.

(11)Remove four screws attaching aft bulkhead cover and remove cover.

(12)Remove upper slave actuator teleflex shaft support clamp adjacent to master actuator.

NOTE : Removal of teleflex support clamps is required to prevent excessive bend radius of shafts during removal.

(13)At master actuator, remove bolts and washers attaching upper slave actuator teleflex shaft to actuator. Disconnect teleflex shaft.

(14)Remove bolts and washers attaching flexshaft to master actuator from synchronous shaft lock.

(15)Remove four bolts and washers attaching synchronous shaft lock to bracket. Remove synch lock and flexshaft from master actuator.

(16)Remove screws, washers, nuts and pins attaching master actuator to thrust reverser clevis fitting. Remove actuator and retain peelable shim, if installed, from between actuator attach fitting and translating sleeve.

(17)Install protective covers on all ports of actuators.

**ON A/C 101-200,

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C. Install master actuator (Ref. Fig. 401).

(1)Prior to installation, verify that master actuator secondary lock position indicator pointer is at extreme edge of brake release zone while maintaining master actuator against its dog stop. If pointer position is incorrect (Ref. 78-31-15, P. Block 601).

(2)Position master actuator with traveling tube through thrust reverser bulkhead and attach to clevis fitting with shear pins, screws, washers and nuts. TORQUE nuts to between 12 and 15 lbf.in. (0.14 and 0.17 m.daN).

CAUTION : DURING ACTUATOR INSTALLATION AND TRANSLATION DO NOT LET TRAVELING TUBE ROTATE OR ACTUATOR WILL BE DE-SYNCHRONIZED.

(3)Extend master actuator secondary lock release handle and retain handle in unlock position.

(4)Verify that the sleeve attach lube fitting is positioned outboard.

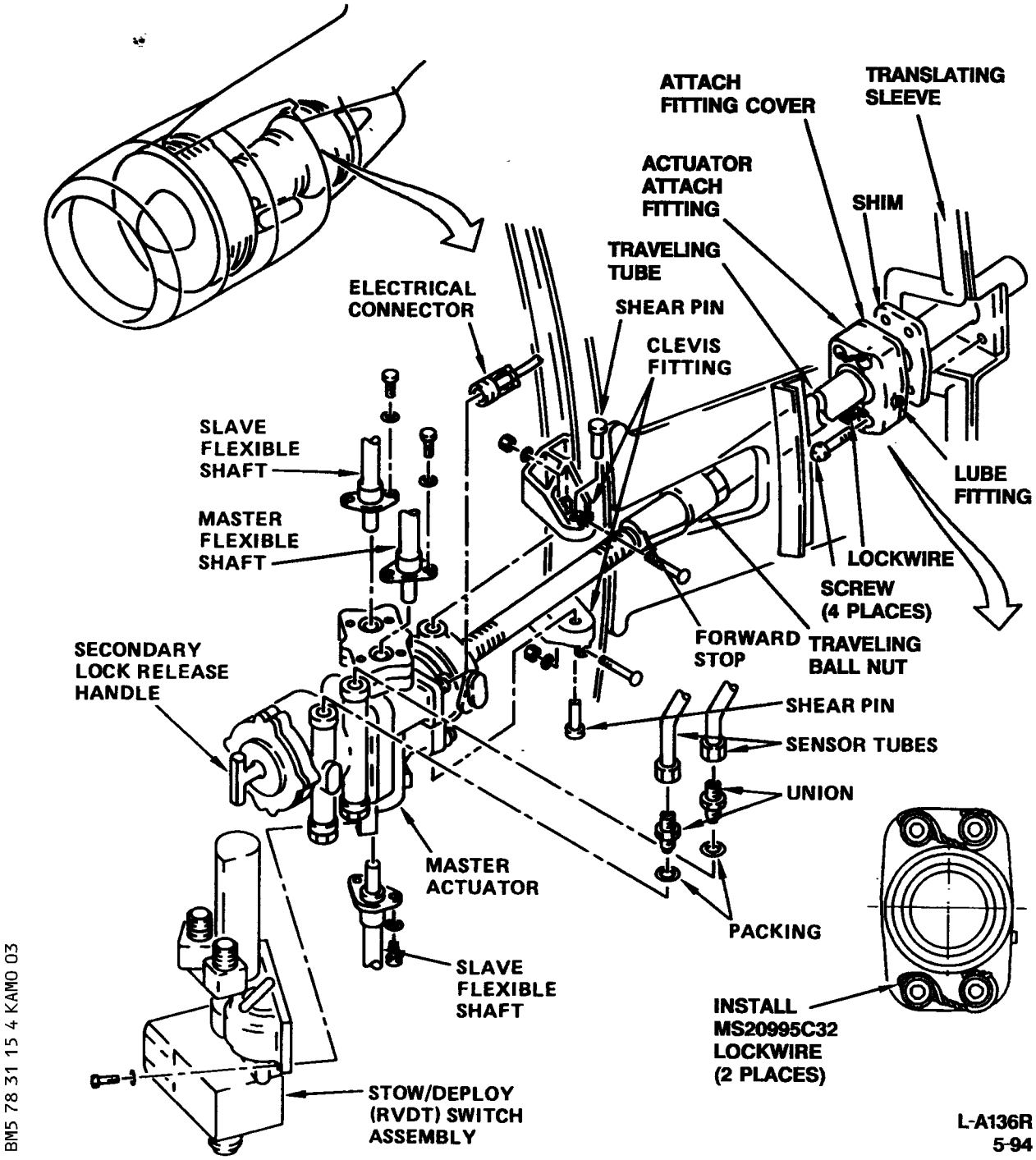
(5)Using 3/8 inch hex wrench in master actuator hex drive extend actuator toward deploy position while holding traveling tube from rotating.

(6)Position peelable shim next to actuator attach fitting on traveling tube.

(7)Extend traveling tube per step (5) until shim contacts translating sleeve.

(8)Apply Material No.P09-002 to screw threads and attach fitting and shim(s) to translating sleeve with four screws. TORQUE screws to between 50 and 70 lbf.in. (0.57 and 0.79 m.daN).
Post SB PW4NAC 78-71, wirelock screws.

(9)Install aft bulkhead cover with four screws.



Master Actuator
Figure 401

(10)Remove protective covers from master actuator and sensor tubes.
(11)Temporarily connect slave actuator teleflex shafts to master actuator.
(12)Make certain synchronous shaft lock handle is in unlock position.
(13)Using 3/8 inch hex wrench in master actuator hex drive, manually drive translating sleeve toward deploy position far enough to provide sufficient access for cascade installation (Ref. 78-32-11, P. Block 201).
CAUTION : IF MORE THAN ONE CASCADE AT A TIME PER THRUST REVERSER HALF IS REMOVED, A GAP CHECK IS REQUIRED BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND AFT CASCADE SUPPORT FRAME AT CASCADE INSTALLATION (REF. 78-32-16, P. BLOCK 401 FOR DETAILED GAP CHECK PROCEDURE).
(14)Install two cascade adjacent to master actuator (Ref. 78-32-12, P. Block 401).
(15)Using 3/8 inch hex wrench in master actuator hex drive, manually drive translating sleeve toward stow position until within 0.40 in. (10.16 mm) of fully stowed.
(16)Disconnect slave actuator teleflex shafts, temporarily installed in step (11), from master actuator.
(17)Remove cover/lock out adapter on each slave actuator.
(18)Using 5/16 inch hex wrench in each slave actuator hex recess and 3/8 inch hex in master actuator hex recess, simultaneously drive all actuators to the fully stowed position against their respective dog stops.
(19)With all three actuators held against their dog stops, connect upper and lower slave actuator teleflex shaft to master actuator receptacles (Ref. 78-31-12, P. Block 401).
NOTE : The master actuator can be moved off its dog stop 1/6 turn (one hex flat) to facilitate shaft installation.
(20)Install support clamps of upper slave actuator teleflex shaft adjacent to master actuator.
(21)Install cover/lockout adapter in storage position (hex drive visible) on each slave actuator with bolts and washers. Lockwire cover.
(22)Re-verify that master actuator secondary lock position indicator pointer is at extreme edge of brake release zone while maintaining master actuator against its dog stop. If pointer position is incorrect, (Ref. 78-31-15, P. Block 601).
(23)Check gap between thrust reverser aft frame (STA 100.00) and translating sleeve forward edge while maintaining master actuator against its dog stop (Ref. 78-31-15, P. Block 201).
NOTE : A red warning band on thrust reverser structure will be visible at 3 and 9 o'clock if the sleeves are not fully stowed.
(24)Check torque required to deploy and stow translating sleeve (Ref. 78-31-15, P. Block 201).
(25)Lubricate new packings with Material No.P03-001 and install with unions and plugs in master actuator ports. TORQUE union and plug to between 125 and 140 lbf.in. (1.42 and 1.58 m.daN).
(26)Connect sensor tubes to unions. TORQUE tube coupling to between 225 and 250 lbf.in. (2.55 and 2.82 m.daN).
(27)Connect electrical connector (DS302 or DS306).
(28)Install RVDT and stow/deploy switch assembly (Ref. 78-31-40, P. Block 401).

**ON A/C 101-200,

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D. Close-Up
(1)Install flexible shaft between master actuator and splitter gearbox. (Ref. 78-31-12, P. Block 401).
(2)Return the manual unlock lever of the synchronous shaft lock in normal position and check wedges at master actuator secondary locks and at PDU brake are removed.
(3)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(4)Close fan cowl doors (Ref. 71-13-00, P. Block 301).
(5)Remove safety clips and tags and close circuit breakers : 3KM, 4KM.
(6)Perform operational test (Ref. 78-32-11, P. Block 501).

**ON A/C 101-200,

4. Slave Actuator Removal/Installation Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :

PANEL	SERVICE	IDENT.	LOCATION
FOR ENGINE 1			
133VU	ENGINES/ENG1 REVERSER WARN	3KM	332/U68
FOR ENGINE 2			
133VU	ENGINES/ENG2 REV WARN	4KM	331/V73

(2)Open fan cowl doors (Ref. 71-13-00, P. Block 301).
CAUTION : TO PREVENT BINDING, ENSURE THRUST REVERSER DOORS ARE LOWERED AND LATCHES LOCKED BEFORE DEPLOYING TRANSLATING SLEEVES.
(3)Ensure thrust reverser doors are completely closed and latches locked (Ref. 71-13-00, P. Block 301).
WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.
(4)Ensure that ground air duct is not connected to ground operation air transfer pneumatic valve.
(5)Disconnect flexible shaft between splitter gearbox and master actuator at actuator (Ref. 78-31-12, P. Block 401).
NOTE : Actuator rigging for left and right hand reversers may be performed independently of one another.

B. Remove slave actuator (Ref. Fig. 402).

(1)Using 3/8 inch hex wrench in master actuator hex drive, manually drive translating sleeve to fully deployed position (Ref. 78-32-11, P. Block 201).

CAUTION : IF MORE THAN ONE CASCADE AT A TIME PER THRUST REVERSER HALF IS REMOVED, A GAP CHECK IS REQUIRED BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND AFT CASCADE SUPPORT FRAME AT CASCADE INSTALLATION (REF. 78-32-16, P. BLOCK 401 FOR DETAILED GAP CHECK PROCEDURE).

(2)Remove cascade adjacent to slave actuator to gain access to slave actuator attach fitting (Ref. 78-32-12, P. Block 401).

(3)Using 3/8 inch hex wrench in master actuator hex drive, manually drive translating sleeve forward to gain access to four screws attaching actuator attach fitting and shim to translating sleeve. (130 turns of hex wrench from deploy toward stow position or a gap of 14.56 in. (370 mm) between translating sleeve forward edge and thrust reverser aft frame) (Ref. 78-31-15, P. Block 201).

(4)Post SB PW4NAC 78-71, remove lockwire. Pre and Post SB PW4NAC 78-71, remove four screws attaching slave actuator attach fitting and shim to translating sleeve.

(5)Remove four screws attaching aft bulkhead cover for actuator removal. Remove cover.

(6)Remove bolt, washer and teleflex shaft clamp adjacent to slave actuator.

NOTE : Removal of teleflex support clamps is required to prevent excessive bend radius of shafts during removal.

(7)At slave actuator, remove bolts and washers attaching teleflex shaft to actuator. Disconnect teleflex shaft.

(8)Remove screws, washers, nuts and pins attaching slave actuator to thrust reverser clevis fitting. Remove actuator and peelable shim. Retain shim for re-installation.

C. Install slave actuator (Ref. Fig. 402).

(1)Position slave actuator with traveling tube through thrust reverser bulkhead and attach to clevis fittings with shear pins, screws, washers and nuts. TORQUE nuts to between 12 and 15 lbf.in. (0.14 and 0.16 m.daN).

(2)Remove cover/lock out adapter on slave actuator.

(3)Using 5/16 inch hex wrench in slave actuator hex drive, manually extend actuator toward deploy position while holding traveling tube from rotating.

(4)Verify that the grease nipple on the actuator attach fitting is positioned outboard.

(5)Position shim next to actuator attach fitting on traveling tube.

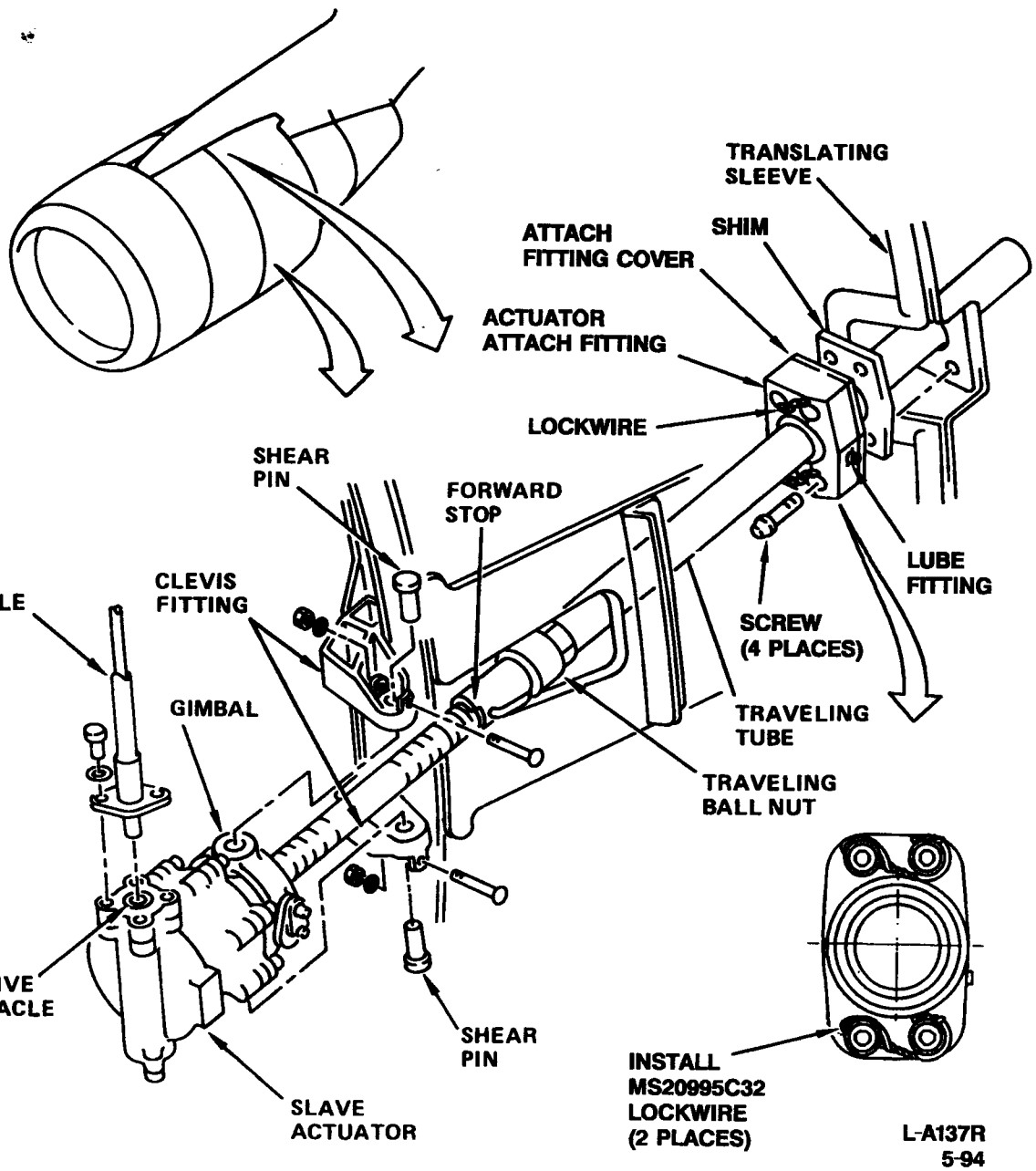
(6)Extend traveling tube per step (3) until shim contacts translating sleeve (Ref. 78-32-11, P. Block 401).

(7)Attach fitting and shim to translating sleeve with four screws. TORQUE screws to between 50 and 70 lbf.in. (0.57 and 0.79 m.daN). Post SB PW4NAC 78-71, wirelock screws.

(8)Temporarily connect slave teleflex shaft to slave actuator.

(9)At master actuator, extend and retain secondary lock release handle in unlock position.

(10)Using 3/8 inch hex wrench in master actuator hex drive, manually drive translating sleeve toward deploy position far enough to provide



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Slave Actuator
Figure 402

sufficient access to install cascade (Ref. 78-32-11, P. Block 201).

CAUTION : IF MORE THAN ONE CASCADE AT A TIME PER THRUST REVERSER HALF IS REMOVED, A GAP CHECK IS REQUIRED BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND AFT CASCADE SUPPORT FRAME AT CASCADE INSTALLATION (REF. 78-32-16, P. BLOCK 401 FOR DETAILED GAP CHECK PROCEDURE).

(11)Install cascade adjacent to slave actuator (Ref. 78-32-12, P. Block 401).
(12)Install aft side bulkhead cover with four screws.
(13)Manually drive translating sleeve toward stow position from master actuator per step (10) within 0.40 in. (10.12 mm) of fully stowed position.
(14)Disconnect slave actuator teleflex shaft from slave actuator.
(15)Using 5/16 inch hex wrench in slave actuator hex drive and 3/8 inch hex wrench in master actuator hex drive, simultaneously drive both actuators to fully stowed position against their respective dog stops.
(16)With both actuators held against their dog stops, connect slave actuator teleflex shaft to slave actuator receptacle and install bolts and washers. TORQUE bolts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN) and wirelock.

NOTE : The master actuator can be moved off its dog stop 1/6 turn (one hex flat) to facilitate teleflex shaft installation.

(17)Install slave teleflex shaft support clamp on bracket adjacent to slave actuator with screw and washer. Torque screw to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
(18)Check gap between thrust reverser aft frame (STA 100.00) and translating sleeve forward edge (Ref. 78-31-15, P. Block 201).

NOTE : A red warning band on the thrust reverser structure at 3 and 9 o'clock will be visible if the sleeves are not fully stowed.

(19)Check torque required to deploy and stow translating sleeve (Ref. 78-31-15, P. Block 201).
(20)Install cover/lock out adapter on slave actuator with bolt, washer and lockwire in storage position (hex drive visible).

**ON A/C 101-200,

R

D. Close-Up
(1)Connect flexible shaft between master actuator and splitter gearbox. (Ref. 78-31-12, P. Block 401).
(2)Return the manual unlock lever of the synchronous shaft lock in normal position and check wedges at master actuator secondary locks and at PDU brake are removed.
(3)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(4)Close fan cowl doors (Ref. 71-13-00, P. Block 301).
(5)Remove safety clips and tags and close circuit breakers : 3KM, 4KM.
(6)Perform operational test (Ref. 78-32-11, P. Block 501).

**ON A/C 101-200,

R

MASTER AND SLAVE ACTUATORS - INSPECTION/CHECK

1. Equipment and Materials

ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breaker Safety Clips
C.	Torque Wrench
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-15, P. Block 201	Master and Slave Actuators
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves

2. Procedure

A. Job Set-Up

(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).

WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2)Install access platform.

(3)Ensure that ground air duct is not connected to air shutoff valve.

B. Inspection (Ref. Fig. 601)

(1)Manually stow translating sleeves (Ref. 78-32-11, P. Block 201).

CAUTION : MAKE SURE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCK POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERS SYSTEM.

(2)Keep the primary brake release handle in pulled position and both synchronous shaft locks in unlock position. Remove wedges at secondary lock handle to release lock on both master actuators.

(3)Check to ensure that secondary lock position indicator is at "DELTA" (plus or minus width of "DELTA" mark) (Ref. Fig. 601). If secondary lock position indicator is not at "DELTA", see 78-31-15, P. Block 201, to resynchronize.

(4)Slowly extend the actuator/sleeve assembly, by means of a 3/8 in. wrench inserted into the master actuator recess. Count the turns. After nine to ten turns the secondary lock will engage and any further movement in the deploy direction will be halted. The translating sleeve will be extended about 1/2 in. from the fully stowed position at this stage.

(5)Return the actuator/sleeve assembly to the fully stowed position (Ref. 78-32-11, P. Block 201).

(6)Repeat the extend operation, but after each turn, pull the secondary lock handle. After two to three turns, handle withdrawal should be mechanical restrained. If the preceding operations check out satisfactorily, then the actuator/sleeve assembly is rigged, and a complete extend/retract cycle, using a hand drive socket, should be performed to verify smooth operation. Subsequent cycles may be made using a power drive socket.

NOTE : It will be necessary to extend the secondary lock handles to cycle.

NOTE : After rigging the system, the secondary lock position indicator pointer may not be in the position shown (Ref. Fig. 601) unless air pressure or drive socket torque is applied.

(7)Remove wrench from master actuator recess and install plate on recess on master actuator with screws.
TORQUE screws to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(8)Release primary brake release handle on PDU.

(9)Release secondary lock release handle on master actuator.

(10)Return the manual unlock lever of the both synchronous shaft locks to normal position.

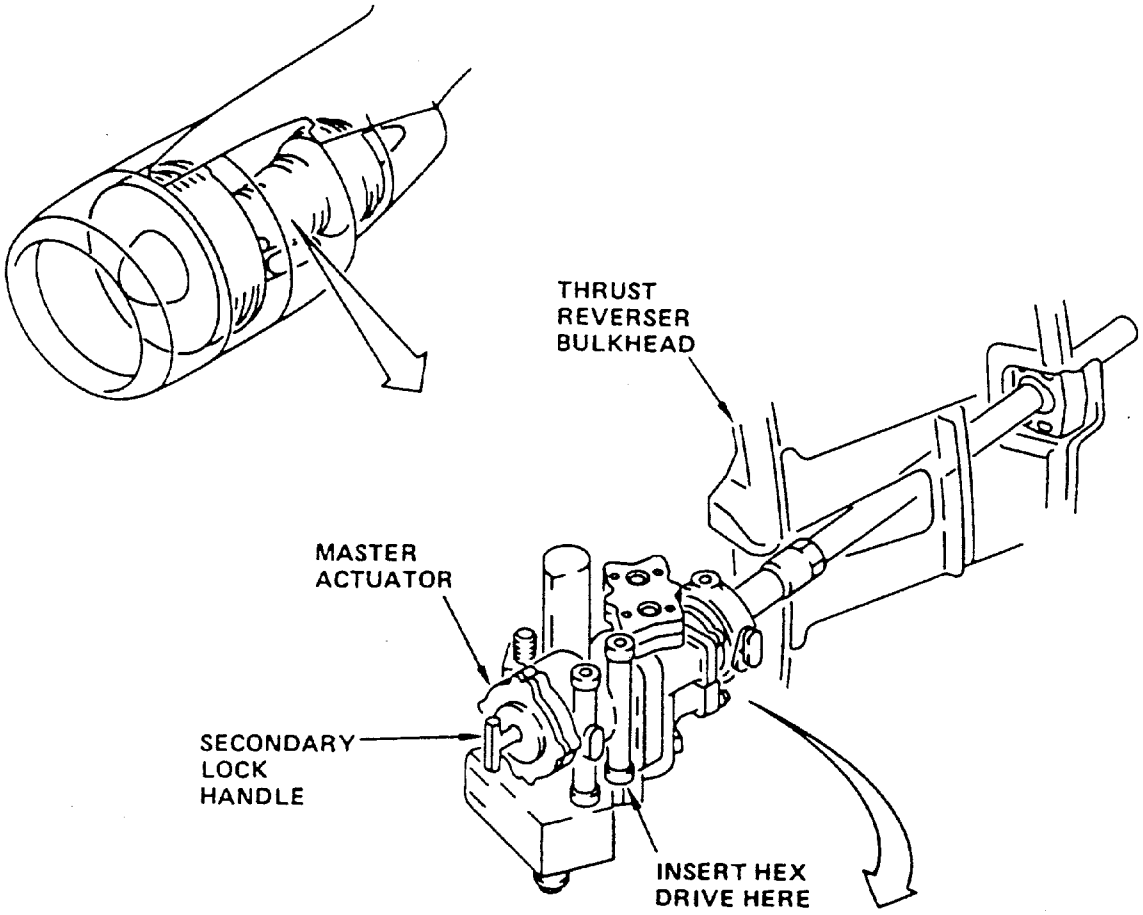
**ON A/C 101-200,

C. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(2)Remove access platform.

(3)Close fan cowl doors, and remove safety clips and tags and close circuit brakers (Ref. 71-13-00, P. Block 301).



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Master Actuator
Figure 601

GROUND OPERATION AIR TRANSFER PNEUMATIC VALVE - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B. Material No.P06-013	Lubricants (Ref. 70-00-00)
C.	Protectives Covers
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 36-13-00, P. Block 1	Ground Compressed Air Supply System
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

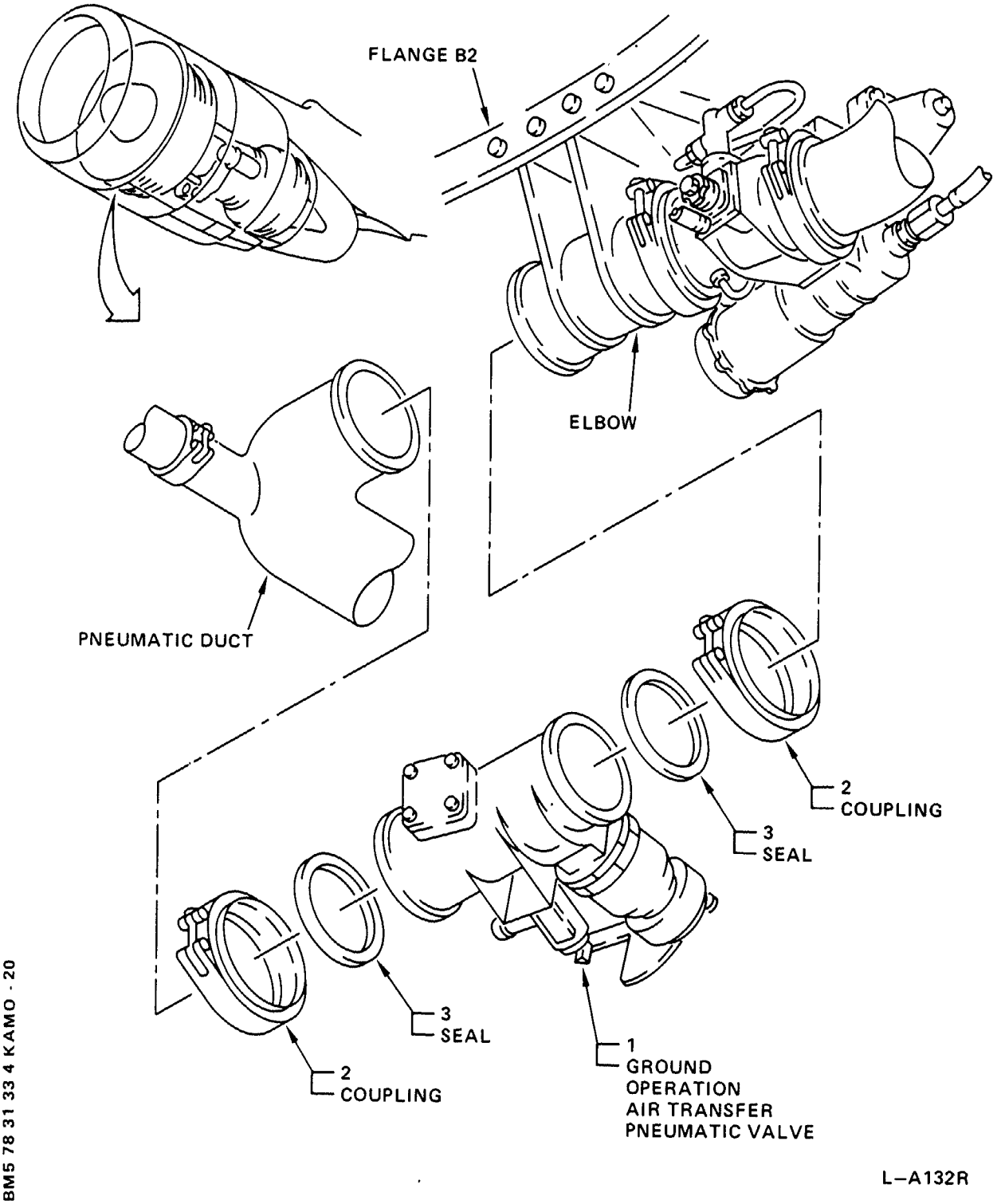
2. Procedure

A. Job Set-Up
Open, safety and tag the appropriate circuit breakers and open the LH fan cowl door (Ref. 71-13-00, P. Block 301).

B. Removal (Ref. Fig. 401)
(1)Remove couplings and seals from valve ports. Seals are reusable. Do not discard.
(2)Remove valve from fan case and install protective covers on ports.

C. Installation (Ref. Fig. 401)
(1)Remove protective covers from valve ports (1) and pneumatic duct.
(2)Apply lubricant, Material No.P06-013, to inside surfaces of duct couplings (2).
(3)Position couplings and seals (3) on valve ports, and valve between elbow and pneumatic duct.
(4)TORQUE couplings to between 115 and 125 lbf.in. (1.3 and 1.41 m.daN).

D. Test (Ref. Fig. 402)
(1)Connect pneumatic ground power unit to the aircraft through the main landing gear ground connector (Ref. 36-13-00, P. Block 1)
(2)Open the door for access to the IDG/Starter and connect the air motor ground air supply hose to the starter pneumatic supply duct (Ref. Fig. 402).
(3)Pull out lockpin and place valve in closed position using handle. Release lockpin to lock valve in closed position. Uncap the ground operation air transfer pneumatic valve
(4)Connect the valve to the tube proceeding from the starter pneumatic supply duct (Ref. Fig. 402)
(5)Pressurize to 40 psi.
(6)On panel 436VU, make certain that PRESS indicator shows the same value as that of the ground power unit.
(7)Check for leakage by passing the hand over the various pneumatic couplings and more particularly at level of coupling located between the directional valve and the pressure regulating valve.



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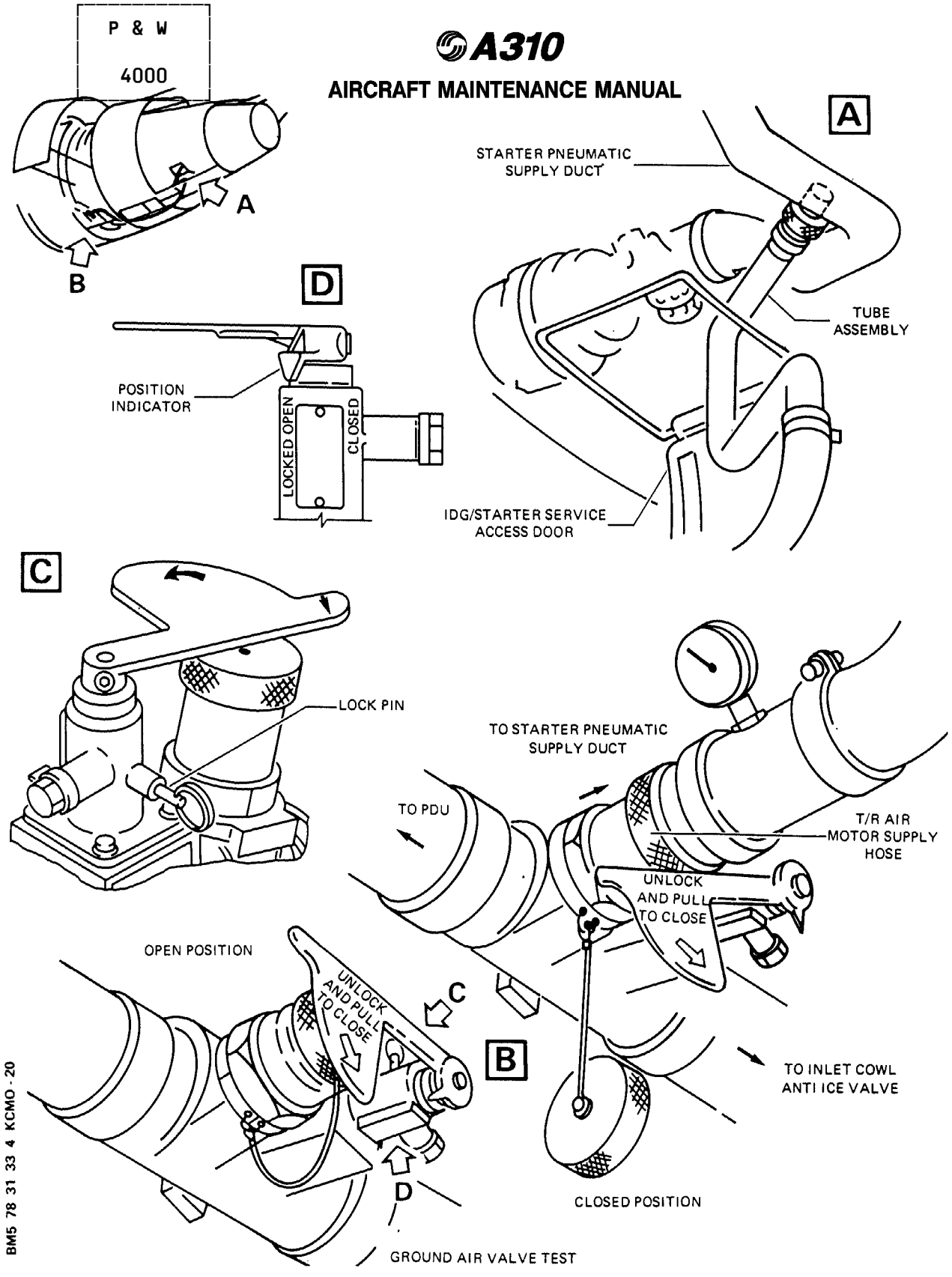
Ground Operation Air Transfer Pneumatic Valve
Figure 401

(8)Shut down pressure supply.

E. Close-Up and Operational Test
(1)Disconnect the pneumatic ground power unit from the aircraft ground connector.
(2)Disconnect the air motor ground air supply hose from the starter pneumatic supply duct and the valve.
(3)Cap the valve then pull out lockpin and place valve in open position using handle. Release lockpin to lock valve in open position.
(4)Close the IDG/starter access door.
(5)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(6)Close LH fan cowl door. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).
(7)Perform operational test (Ref. 78-32-11, P. Block 501).



Ground Air Valve Test
Figure 402

PNEUMATIC DRIVE UNIT SUPPLY DUCTS - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A. Material No.P03-001	Oil (Ref. 70-00-00)
B. Material No.P06-013	Lubricants (Ref. 70-00-00)
C. Material No.P06-016	Lubricants (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-05, P. Block 401	Pressure Regulating and Shutoff Valve
- 78-31-33, P. Block 401	Ground Operation Air Transfer Pneumatic Valve
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

2. Procedure

A. Job Set-Up
Open, safety and tag the appropriate cicuit breakers and open the fan cowl doors (Ref. 71-13-00, P. Block 301).

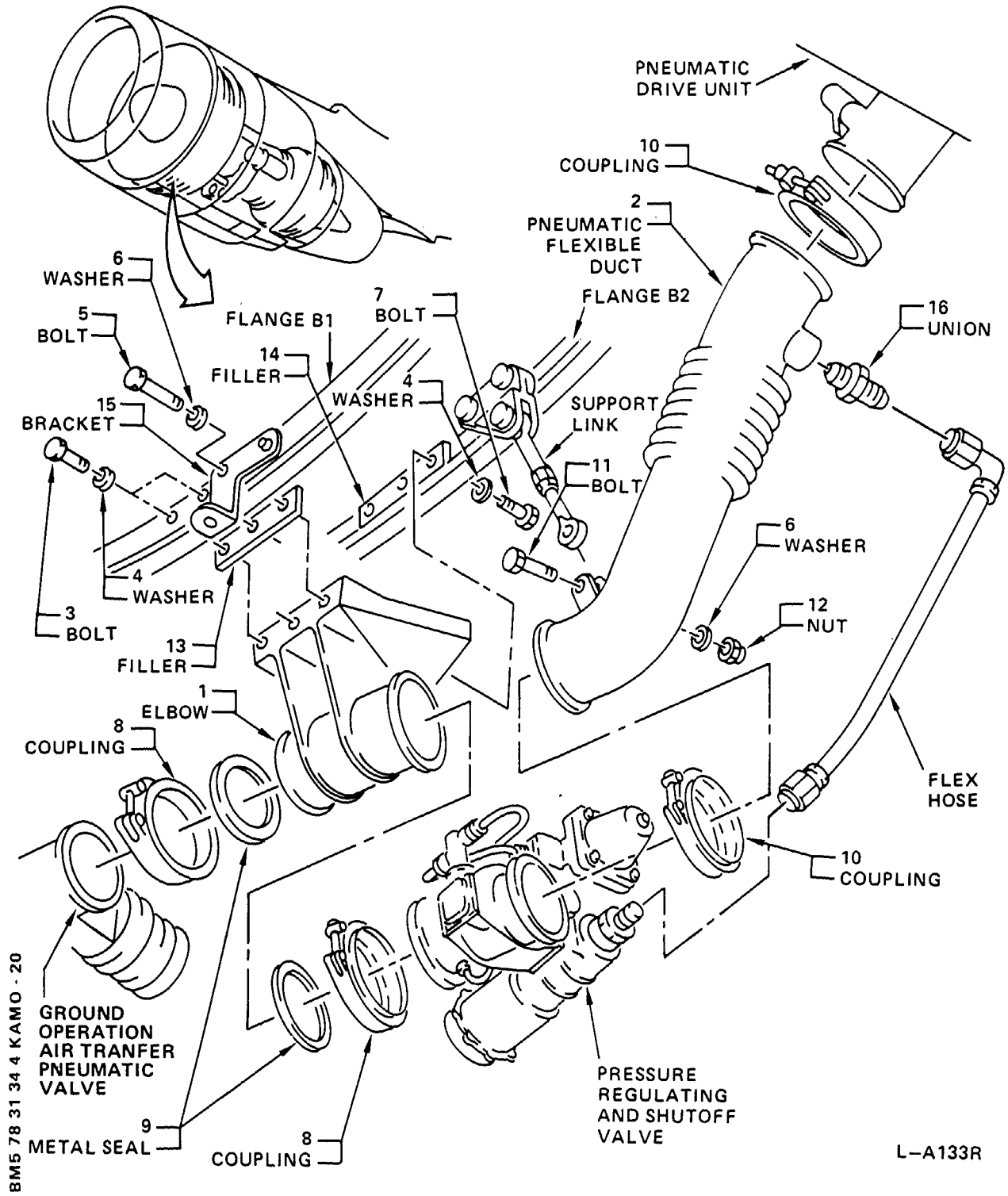
B. Removal (Ref. Fig. 401)
(1)Remove pneumatic duct elbow (1).
(a)Remove couplings and seals from elbow flanges. Retain metal seals.
(b)Remove bolts and washers attaching elbow, bracket, and filler to fan case Flange B1. Remove bracket and filler.
(c)Remove bolts and washers attaching elbow and filler to fan case Flange B2.
(d)Remove bracket, filler and elbow from fan case flanges.
(e)Install protective covers on valve ports.
(2)Remove pressure regulating and shutoff valve (Ref. 78-31-05, P. Block 401).
(3)Remove pneumatic flexible duct (2).
(a)Remove bolt, washer, and nut attaching support link to pneumatic duct.
(b)Disconnect flexible hose from pneumatic flexible duct and install protective covers.
(c)Remove union from flexible duct.
(d)Remove couplings from ends of pneumatic ducting.
(e)Remove ducting and install protective covers on open ports of pneumatic drive unit and valve.

C. Installation (Ref. Fig. 401)
(1)Install pneumatic duct elbow (1).
(a)Remove protective covers from valve port.
(b)Position elbow to engine fan case with elbow mounting flange between case Flanges B1 and B2. Install fillers (13 and 14) as shown.
(c)Measure gap between filler and fan case flange. Install fillers as required to provide 0.010 in. (0.254 mm) maximum gap.
(d)Install two bolts (5), threads lubricated with Material No.P03-001, washers (6) and bracket (15) to upper forward bolt holes. Do not tighten bolts.

(e)Install two bolts (3), threads lubricated with Material No.P03-001 and washers (4) in lower forward bolt holes. Do not tighten bolts.
(f)Install four bolts (7), threads lubricated with Material No.P03-001 and washers (4) through Flange B2 bolt holes. Do not tighten bolts.
(g)Check alignment of elbow duct mating flange with air transfer pneumatic valve.
1 Flange OD radial alignment must be within 0.060 in. (1.524 mm) maximum and mating face angular gap must be within 0.030 in. (0.762 mm) maximum.
(h)Apply lubricant, Material No.P06-013, to inside surfaces of coupling (8).
(i)Install seal (9) and coupling (8) to mating flanges of elbow duct and air transfer pneumatic valve. Hand tighten coupling.
(j)Torque bolts retaining elbow to engine fan case flanges.
(k)Torque coupling to value indicated on coupling.
(2)Install pressure regulating and shutoff valve (Ref. 78-31-05, P. Block 401).
(3)Install pneumatic flexible duct (2).
(a)Remove protective covers from PDU and valve.
(b)Apply lubricant, Material No.P06-013 to inside surfaces of couplings.
(c)Position pneumatic flexible ducting between pneumatic drive unit and pressure regulating and shutoff valve with couplings (10) in place and tighten couplings fingertight.
(d)Check duct flanges alignment for maximum radial offset of 0.060 in. (1.524 mm) and mating face angular gap of 0.030 in. (0.762 mm) maximum.
(e)Attach support link to pneumatic ducting with bolt (11), threads lubricated with Material No.P03-001, nut (12), and washer (6).
(f)Torque couplings to value indicated on coupling band.
(g)Apply lubricant, Material No.P06-016, to union threads and install union in pneumatic ducting.
(h)Connect hose coupling to union (16).

D. Test
(1)Perform test (Ref. 78-31-33, P. Block 401).
(2)Perform operational test (Ref. 78-32-11, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. BLock 301).



Pneumatic Drive Unit Supply Ducts
Figure 401

SPLITTER GEARBOX - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
C.	Corrosion Resistant Steel Lockwire (MS 20995C32) (Ref. 70-00-00)
D. Material No.P03-001	Oils (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

2. Procedure (Ref. Fig. 401)

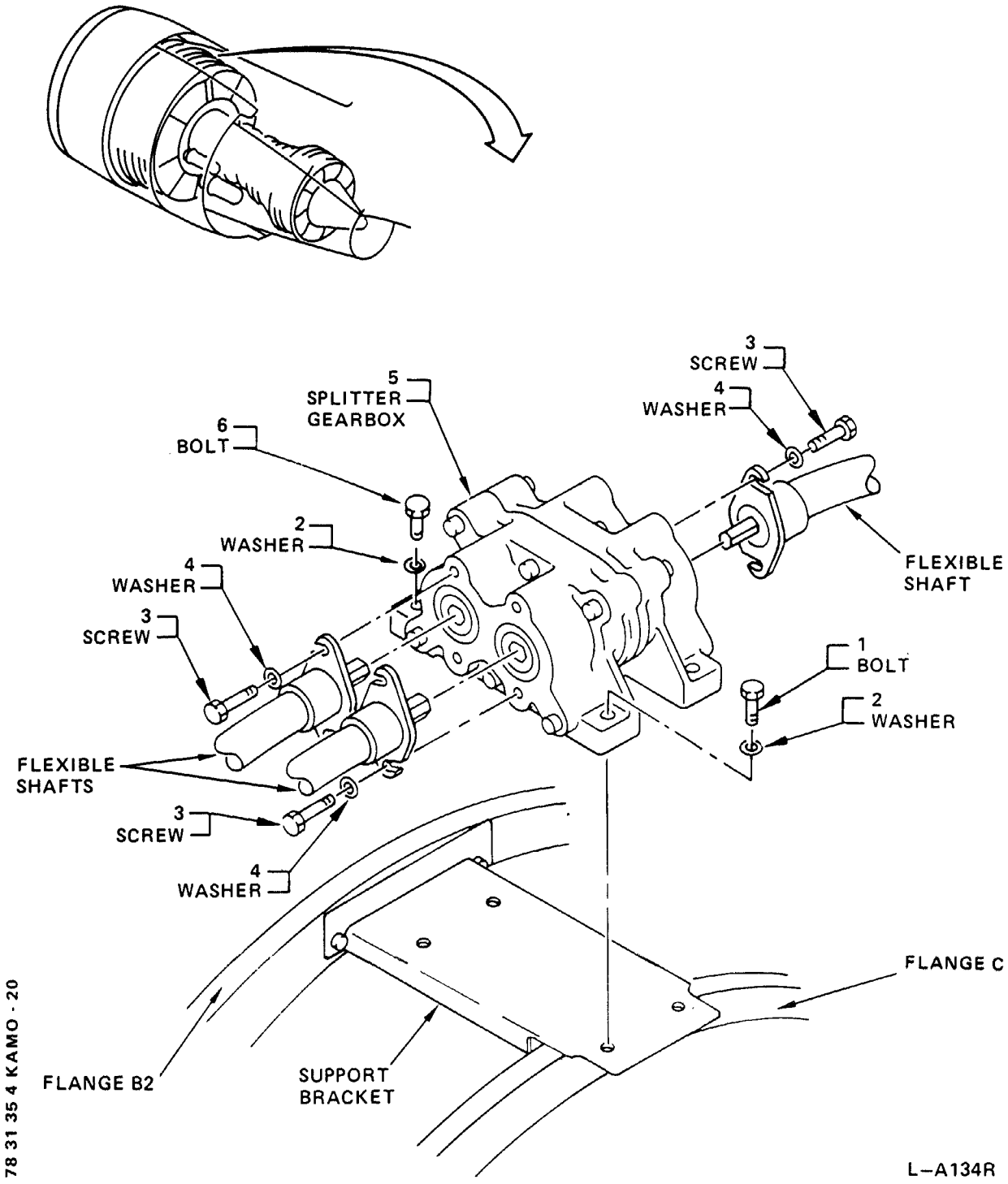
A. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform

B. Removal
(1)Remove screws and washers attaching three flexible shafts to splitter gearbox.
(2)Remove bolts and washers attaching gearbox to fan case bracket and remove gearbox.

C. Installation
(1)Install splitter gearbox (5) on fan case bracket with bolts (1) and (6), threads lubricated with Material No.P03-001, and washers (2). TORQUE bolts to between 50 and 70 lbf. in. (0.57 and 0.79 m.daN) and wirelock.
(2)Insert flexible shafts into gearbox and install screws (3), threads lubricated with Material No.P03-001, and washers (4) attaching flanges of shafts to gearbox.
(3)TORQUE screws to between 20 and 25 lbf. in. (0.23 and 0.28 m.daN).

D. Test
(1)Perform operational test (Ref. 78-32-11, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Remove access platform.
(3)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



Splitter Gearbox
Figure 401

THRUST REVERSER SENSOR TUBES - REMOVAL/INSTALLATION

R 1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
C. Material No.P03-001	Oils (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.

B. Removal
(1)Remove thrust reverser sensor tubes from left side of fan case (Pre SB PW4 ENG 78-46) (Ref. Fig. 401).
(a)Remove nuts, washers, screws and clamps securing tubes to fan case brackets.
(b)Disconnect tubes from pressure regulating and shutoff valve.
(c)Remove unions and packings from valve and discard packing.
(d)Disconnect jamnuts from tubes on fan case brackets adjacent to splitter gearbox and remove tubes.
(e)Disconnect tubes at unions and separate tubes.
(2)Remove thrust reverser sensor tubes from left side of fan case (Post SB PW4 ENG 78-46) (Ref. Fig. 401).
(a)Remove nuts, washers, screws and clamps securing tubes to fan case brackets.
(b)Disconnect tubes between bulkhead unions and pressure regulating and shutoff valve unions.
Safety cap valve unions.
(c)Remove and retain bulkhead unions.
(d)Remove tubes between bulkhead unions.
(e)Disconnect jamnuts from tubes on fan case brackets adjacent to splitter gearbox.
(f)Slide tubes through guide bracket and remove.
(3)Remove sensor tubes from thrust reverser bulkhead (Ref. Fig. 402).
(a)Disconnect hoses from unions in master actuator.
(b)Remove unions and packings and discard packings.
(c)Disconnect hoses from unions at bulkhead bracket.
(d)Remove nuts, washers, bolts, and clamps securing tubes to bulkhead brackets.
(e)Disconnect tubes from unions at upper bulkhead bracket. Remove tubes.
(f)Disconnect upper hoses from unions on bulkhead bracket, pylon, and fan case bracket. Remove hoses.

(g)Remove nuts and unions from fan case bracket and bulkhead bracket.

C. Installation

(1)Install thrust reverser sensor tubes on left side of fan case (Pre SB PW4 ENG 78-46) (Ref. Fig. 401).

(a)Install tubes (3) and (6) in brackets (two places) adjacent to splitter gearbox with jamnuts (7), threads lubricated with Material No.P03-001. TORQUE jamnuts to between 125 and 140 lbf. in. (1.41 and 1.58 m.daN).

(b)Connect tubes (3) and (6) to unions (11) and TORQUE couplings to between 270 and 300 lbf. in. (3.05 and 3.39 m.daN).

(c)Connect tube (5) to union in tube (3) and tube (2) to union in tube (6). TORQUE tube couplings to between 270 and 300 lbf. in. (3.05 and 3.39 m.daN).

(d)Connect tube (4) to union in tube (5), threads lubricated with Material No.P03-001, and tube (1) to union in tube (2), threads lubricated with Material No.P03-001. TORQUE tube couplings to between 270 and 300 lbf. in. (3.05 and 3.39 m.daN).

(e)Install packings (13) and unions (11) in ports of pressure regulating and shutoff valve. TORQUE unions to between 125 and 140 lbf. in. (1.41 and 1.58 m.daN).

(f)Connect tube (4) to union in inboard port and tube (1) to union in aft facing port of pressure regulating and shutoff valve. TORQUE couplings to between 270 and 300 lbf. in. (3.05 and 3.39 m.daN).

(g)Starting at top of fan case, secure sensor tubes to Flange C brackets with clamps (9) and screws (12), threads lubricated with Material No.P03-001, (six places). TORQUE screws to between 20 and 25 lbf. in. (0.23 and 0.28 m.daN).

(h)Secure tubes (1) and (4) to lower Flange C bracket with clamps (9), screws (12), threads lubricated with Material No.P03-001, washer (8) and nut (10). TORQUE nut to between 20 and 25 lbf. in. (0.23 and 0.28 m.daN).

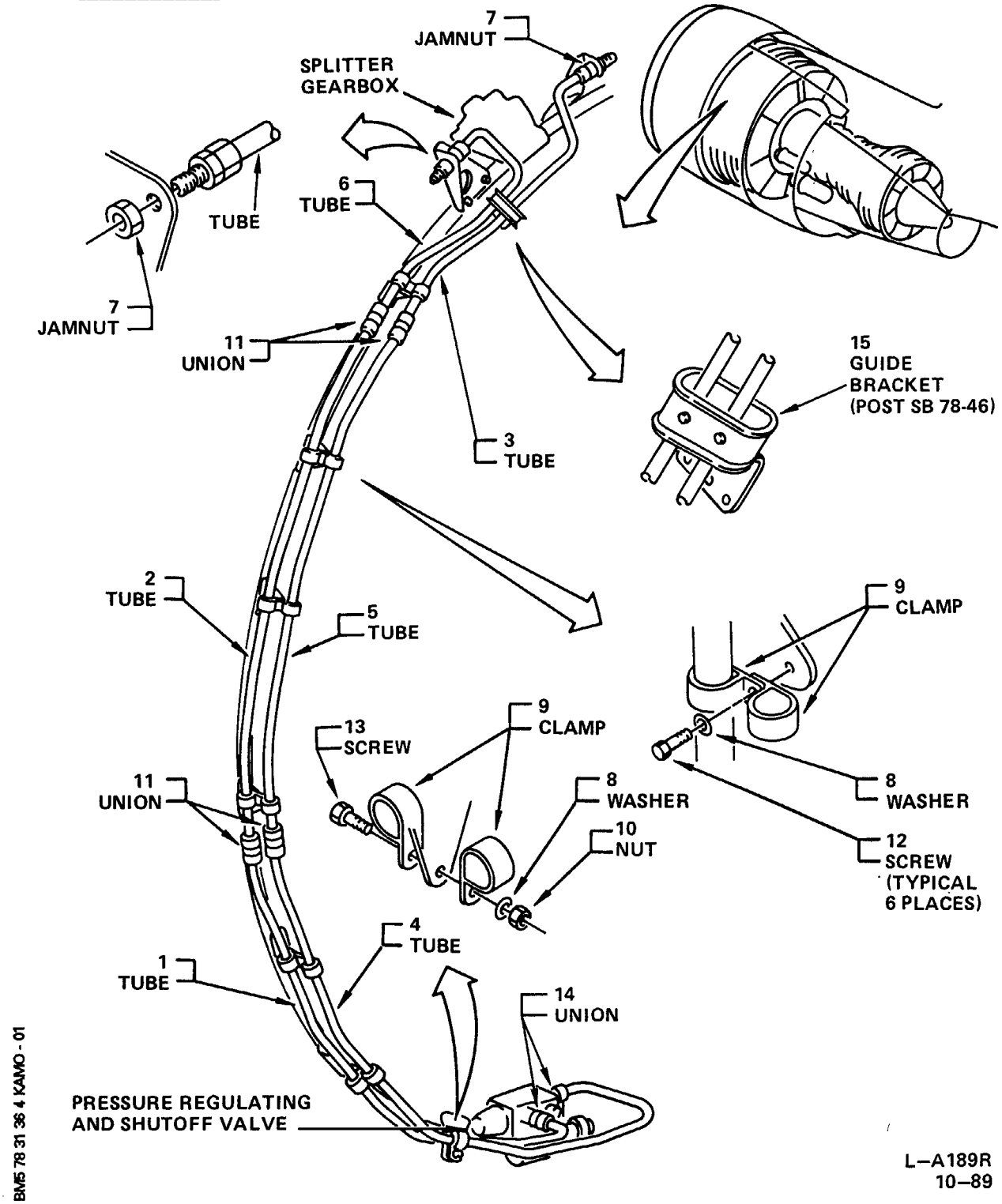
(2)Install thrust reverser sensor tubes on left side of fan case (Post SB PW4 ENG 78-46) (Ref. Fig. 401).

(a)Position tubes (3) and (6) through guide bracket (15) and connect to unions (11) threads lubricated with Material No.P03-001, in brackets (two places) adjacent to splitter gearbox with jamnuts (7) threads lubricated with Material No.P03-001.
TORQUE jamnuts to between 125 and 140 lbf.in. (1.42 and 1.58 m.daN) and TORQUE couplings to between 270 and 300 lbf.in. (3.06 and 3.38 m.daN).

(b)Connect tube (5) to union in tube (3) threads lubricated with Material No.P03-001, and tube (2) to union in tube (6) threads lubricated with Material No.P03-001.
TORQUE tube couplings to between 270 and 300 lbf.in. (3.06 and 3.38 m.daN).

(c)Connect tube (4) to union in tube (5) threads lubricated with Material No.P03-001, and tube (1) to union in tube (2) threads lubricated with Material No.P03-001.
TORQUE tube couplings to between 270 and 300 lbf.in. (3.06 and 3.38 m.daN).

(d)Remove safety caps from unions (14) in ports of pressure regulating



Thrust Reverser Sensor Tubes - Fan Case - Left Side
Figure 401

and shutoff valve.

(e)Connect tube (4) to union threads lubricated with Material No.P03-001, in inboard port and tube (1) to union lubricated with Material No.P03-001, in aft facing port of pressure regulating and shutoff valve. TORQUE couplings to between 270 and 300 lbf.in. (3.06 and 3.38 m.daN).

(f)Starting at top of fan case, secure sensor tubes to Flange C brackets with clamps (9) and screws (12) threads lubricated with Material No.P03-001, (six places). TORQUE screws to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(g)Secure tubes (1) and (4) to lower Flange C bracket with clamps (9), screws (12) threads lubricated with Material No.P03-001, washer (8) and nut (10).
TORQUE nut to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(3)Install sensor tubes on thrust reverser bulkhead.
(Ref. Fig. 402).

R NOTE : Installation of sensor tubes for right thrust reverser bulkhead
R is the opposite view of the left thrust reverser bulkhead,
R except for the right hand variation for the crossed tubes shown
R in (Ref. Fig. 402).

CAUTION : WHEN YOU INSTALL THE TUBE (1), MAKE SURE THAT IT IS INSTALLED IN THE FORWARD UNION AT THE BULKHEAD BRACKETS. MAKE SURE THAT THE TUBE (2) IS INSTALLED IN THE AFT UNION AT THE BULKHEAD BRACKETS. DAMAGE TO THE EQUIPMENT COULD OCCUR IF THE TUBES ARE INADVERTENTLY SWAPPED.

(a)Connect tubes (1), (2) to unions (8), threads lubricated with Material No.P03-001, in upper and lower bulkhead brackets. TORQUE couplings to between 270 and 300 lbf. in. (3.05 and 3.39 m.daN).

(b)Secure tubes (1), (2) to thrust reverser bulkhead with clamps (13), bolts (9), threads lubricated with Material No.P03-001, washers (6) and nuts (7) (three places). TORQUE nuts to between 20 and 25 lbf. in. (0.23 and 0.28 m.daN).

(c)Connect flexible hose (11) to aft union, threads lubricated with Material No.P03-001, on bulkhead bracket and to pylon mounted union. TORQUE couplings to between 270 and 300 lbf. in. (3.05 and 3.39 m.daN).

(d)Connect flexible hose 10 to forward union, threads lubricated with Material No.P03-001, on bulkhead bracket and to union on fan case bracket adjacent to splitter gearbox. TORQUE couplings to between 270 and 300 lbf. in. (3.05 and 3.39 m.daN).

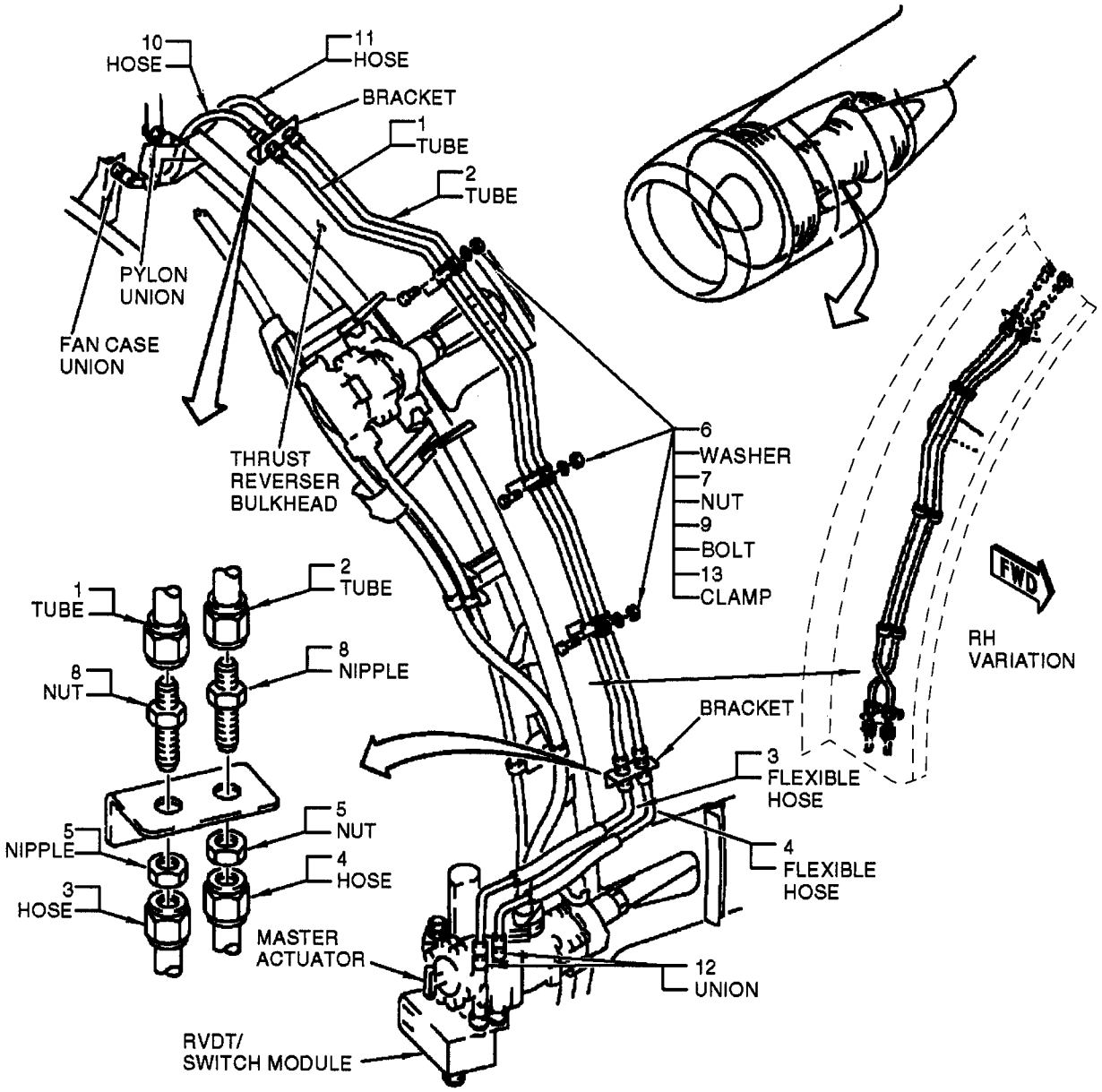
(e)Connect flexible hoses (3), (4) to unions (12), threads lubricated with Material No.P03-001, in master actuator and unions (8), threads lubricated with Material No.P03-001, in lower bracket. TORQUE hose couplings to between 270 and 300 lbf. in. (3.05 and 3.39 m.daN).

D. Test

(1)Perform operational test (Ref. 78-32-11, P. Block 501).

E. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.



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Thrust Reverser Sensor Tubes - Thrust Reverser Bulkhead
Figure 402

R

(2)Close fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.

THRUST REVERSER PNEUMATIC HOSES - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breakers Safety Clips
B. Material No.P03-001	Oils (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

2. Procedure

A. Job Set-Up
(1) Open, safety and tag the appropriate circuit breakers and open LH fan cowl door (Ref. 71-13-00, P. Block 301).

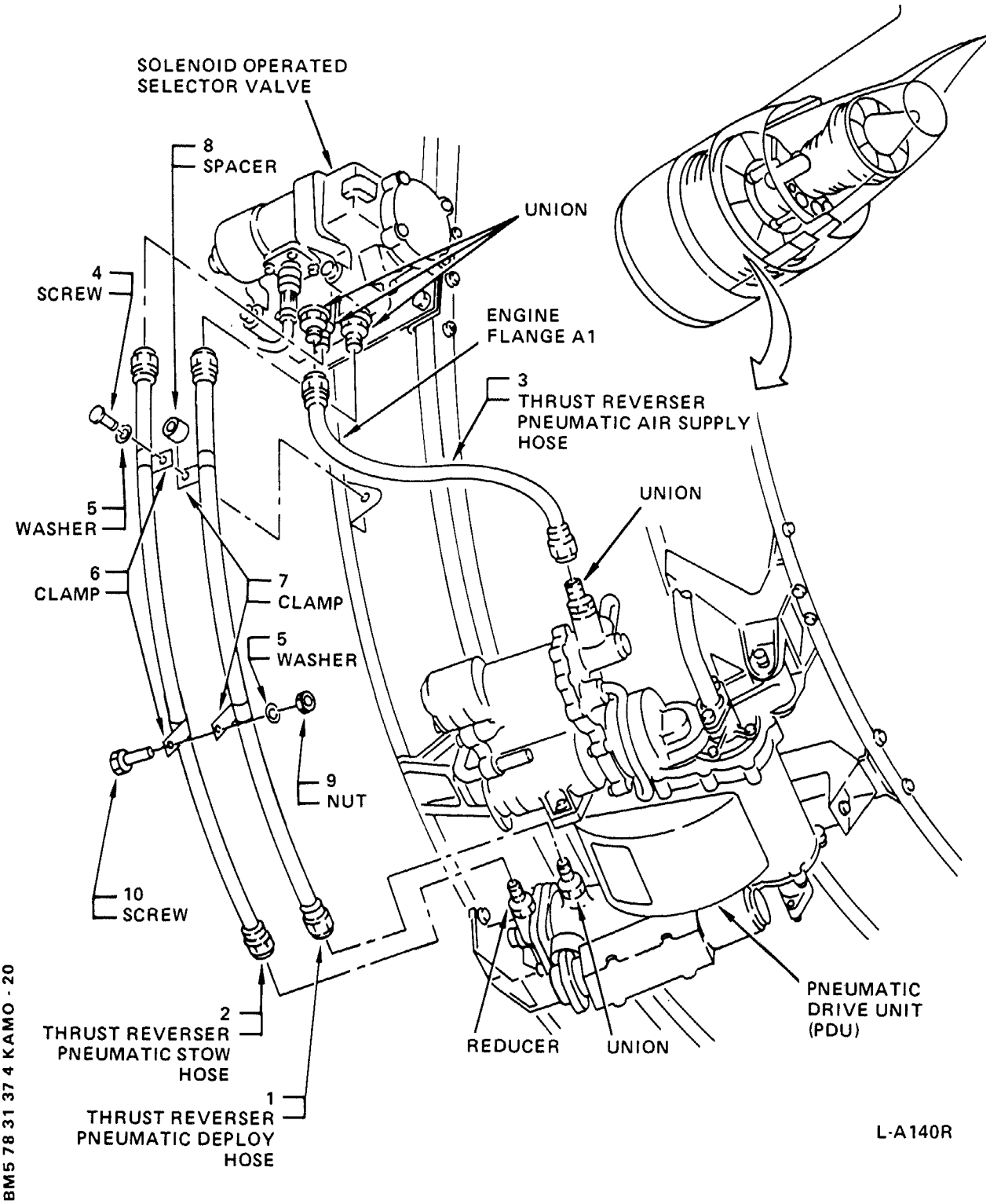
B. Removal (Ref. Fig. 401, 402)
(1) Disconnect pneumatic hose from union in pressure regulating and shutoff valve and union in pneumatic flexible duct and remove hose. (Ref. Fig. 401).
(2) Install protective caps on hose and unions.
(3) Disconnect thrust reverser pneumatic deploy, stow, and air supply hoses from solenoid operated selector valve (three places) and from pneumatic drive unit (three places). (Ref. Fig. 402).
(4) Install protective caps on valves and hoses and remove hoses from fan case.

C. Installation (Ref. Fig. 401, 402)
(1) Connect hose couplings threads lubricated with Material No.P03-001, to pneumatic flexible duct and pressure regulating and shutoff valve (Ref. Fig. 401). TORQUE couplings to between 270 and 300 lbf.in. (3.05 and 3.39 m.daN).
(2) Connect thrust reverser pneumatic deploy hose (1) couplings, threads lubricated with Material No.P03-001, to aft outboard union in solenoid selector valve and aft union on pneumatic drive unit (Ref. Fig. 402). TORQUE couplings to between 180 and 200 lbf.in. (2.03 and 2.26 m.daN).
(3) Connect thrust reverser pneumatic air supply hose couplings (3), threads lubricated with Material No.P03-001, to inboard union in solenoid selector valve and union on top of pneumatic drive unit. TORQUE couplings to between 270 and 300 lbf.in. (3.05 and 3.39 m.daN).
(4) Connect thrust reverser pneumatic stow hose coupling, threads lubricated with Material No.P03-001, to forward outboard union in solenoid operated selector valve and forward reducer on pneumatic drive unit. TORQUE couplings to between 135 and 150 lbf.in. (1.53 and 1.69 m.daN).
(5) Secure stow and deploy hoses to bracket on flange A1 with clamps (6) and (7), screw (4), threads lubricated with Material No.P03-001, washer (5), and spacer (8). Clamp hoses (1) and (2) together 10 in. (254 mm) below flange A1 bracket with clamp (6) and (7), screw (10), threads lubricated with Material No.P03-001, washer (5) and nut (9). TORQUE screws to

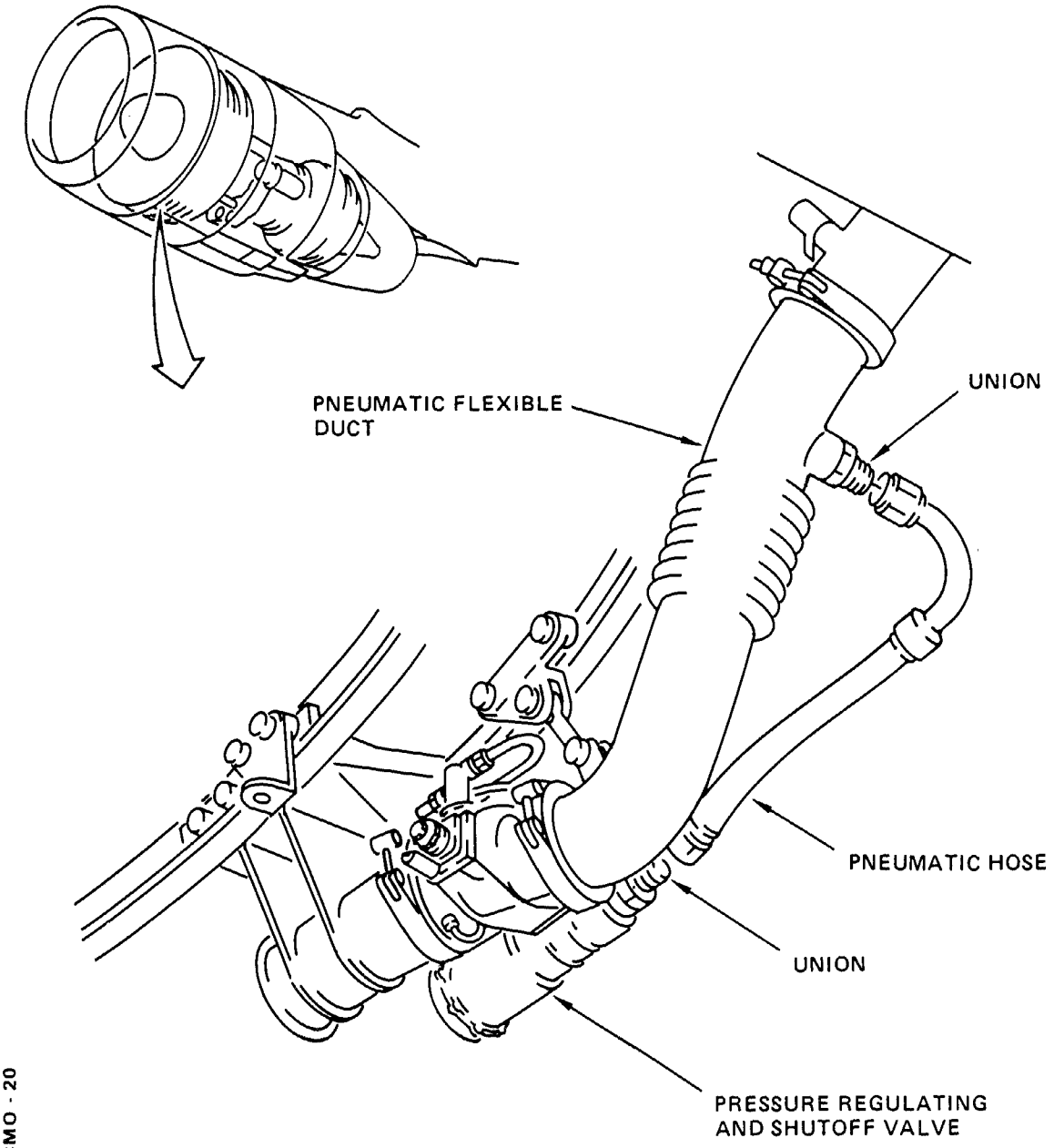
between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

D.Test
(1)Perform operational test (Ref. 78-32-11, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close LH fan cowl door. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



Pressure Regulating and Shutoff Valve Pneumatic Hose
Figure 401



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Selector Valve/PDU Pneumatic Hoses
Figure 402

THRUST REVERSER ELECTRICAL WIRING REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breaker Safety Clips
C.	Torque Wrench
D.	Corrosion Resistant Steel Lockwire MS20995N20
E.	Nut, Self-Locking
Referenced Procedures	
- 70-00-00, P. Block 201	Engine Standard Practices
- 71-13-00, P. Block 301	Cowl Doors
- 75-25-03, P. Block 401	Nacelle Core Compartment Cooling Electrical Harness
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

2. Procedure

**ON A/C 101-200,

R

A. Job Set-Up

CAUTION : SOME THRUST REVERSER ACTUATION SYSTEM COMPONENTS ARE ELECTRICALLY CONNECTED TO WEIGHT ON WHEELS (WOW) SWITCHES. DO NOT OPEN THESE CIRCUIT BREAKERS.

(1)Open, safety and tag the following circuit breakers :

PANEL	SERVICE	IDENT.	LOCATION
FOR ENGINE 1			
133VU	ENGINES/ENG1 REVERSE CTL	1KM	332/U69
133VU	ENGINES/ENG1 REVERSE WARN	3KM	332/U68
133VU	ENGINES/ENG1 THRUST REVERSER LOCK	45KM	332/U67
133VU	ENG1/SCU SUPPLY GND	35KS	333/T76
133VU	ENG1/SCU SUPPLY FLT	37KS	333/T75
FOR ENGINE 2			
133VU	ENGINES/ENG2 REV CTL	2KM	331/V74
133VU	ENGINES/ENG2 REV WARN	4KM	331/V73
133VU	ENGINES/ENG2 THRUST REVERSER LOCK	44KM	331/V75
133VU	ENG2/SCU SUPPLY GND	34KS	333/T85
133VU	ENG2/SCU SUPPLY FLT	36KS	333/T84

CAUTION : TO PREVENT BINDING, ENSURE THAT THRUST REVERSER DOORS ARE LOWERED AND LATCHED BEFORE DEPLOYING TRANSLATING SLEEVES.

(2)Close and tag thrust reverser doors (Ref. 71-13-00, P. Block 301).

WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTE-

NANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(3)Position access platform.
(4)Open fan cowl doors (Ref. 71-13-00, P. Block 301).
(5)Ensure that ground air duct is not connected to ground operation air transfer pneumatic valve.

**ON A/C 101-200,

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B. Removal (Ref. Fig. 401, 402, 403)
(Ref. Fig. 404, 405)
(1)Remove right RVDT and stow/deploy switch wire harness (21W4132).
(a)Remove lockwire and disconnect electrical connector D5002P from left thrust reverser switch circuit junction box (Ref. Fig. 401).
(b)Remove lockwire and disconnect electrical connector D5008J from D5008P
(c)Remove the attaching hardware from connector D5008J. (Ref. Fig. 405).
(d)Remove two clamps (1) and attaching hardware (Ref. Fig. 401).
(e)Remove wire harness.
(2)Remove wire harness (21W4140).
(a)Remove lockwire and disconnect electrical connector D5011P from right thrust reverser junction box (Ref. Fig. 403).
(b)Remove lockwire and disconnect electrical connector DH15 from selector vavlve (Ref. Fig. 402).
(c)Remove lockwire and disconnect electrical connector DS304 from pneumatic drive unit (PDU) (Ref. Fig. 402).
(d)Remove lockwire and disconnect electrical connector DH9 from regulator/shutoff valve (Ref. Fig. 402).
(e)Remove four clamps (3) and attaching hardware (Ref. Fig. 403).
(f)Remove two clamps (1), six clamps (2) and attaching hardware (Ref. Fig. 402).
(g)Remove wire harness.
(3)Remove thrust reverser control wire harness (21W4076).
(a)Remove lockwire and disconnect electrical connector D4986J from D4986P (Ref. Fig. 404).
(b)Remove lockwire and disconnect electrical connector D4966P from pylon interface (Ref. Fig. 403).
(c)Remove lockwire and disconnect electrical connector D4987J from D4987P (Ref. Fig. 403).
(d)Remove lockwire and disconnect electrical connectors D5006P, D5010P, and D5007P from right thrust reverser switch circuit junction box (Ref. Fig. 403).
(e)Remove the attaching hardware from connectors D4986J and D4987J.
(f)Remove two clamps (1) and attaching hardware (Ref. Fig. 401).
(g)Remove four clamps and attaching hardware from Flange B1, right to left across the top of the fan case.
(h)Remove clamp (1), three clamps (2) and attaching hardware

(Ref. Fig. 401).
(i)Remove wire harness.
(4)Remove wire harness (21W4082) (Ref. Fig. 404).
(a)Remove lockwire and disconnect electrical connector D4986P from D4986J.
(b)Remove lockwire and disconnect electrical connector DS306 from secondary lock switch.
(c)Remove lockwire and disconnect electrical connector DS307 from stow/deploy switch.
(d)Remove three clamps (1), two clamps (2) eight clamps (3), clamp (4), three clamps (5), four clamps (6) and attaching hardware.
(e)Remove lockwire and disconnect the electrical connector DV227 (or DV229 for nacelle cooling system in poppet valve configuration) from the left hand inner barrel cooling duct shut off valve and remove clamps and attaching hardware (Ref. 75-25-03, P. Block 401).
(f)Remove wire harness.
(5)Remove wire harness (21W4146) (Ref. Fig. 404).
(a)Remove lockwire and disconnect electrical connector D5003P from left thrust reverser switch circuit junction box (Ref. Fig. 401).
(b)Remove lockwire and disconnect electrical connector D5014P from Channel A of left RVDT and stow/deploy switch.
(c)Remove lockwire and disconnect electrical connector D5015P from Channel B of left RVDT and stow/deploy switch.
(d)Remove three clamps (1), two clamps (2), eight clamps (3), two clamps (6) and attaching hardware.
(e)Remove wire harness.
(6)Remove wire harness (21W4080) (Ref. Fig. 405)
(a)Remove lockwire and disconnect electrical connector D4987P from D4987J.
(b)Remove lockwire and disconnect electrical connector DS301 from right stow/deploy switch.
(c)Remove lockwire and disconnect electrical connector DS302 from right secondary lock switch.
(d)Remove clamp (1), five clamps (2), eight clamps (3), three clamps (4), three clamps (5) and attaching hardware.
(e)Remove lockwire and disconnect the electrical connector DV228 (or DV230 for nacelle cooling system in poppet valve configuration) from the left hand inner barrel cooling duct shut off valve and remove clamps and attaching hardware (Ref. 75-25-03, P. Block 401).
(f)Remove wire harness.
(7)Remove wire harness (21W4144) (Ref. Fig. 405)
(a)Remove lockwire and disconnect electrical connector D5008P from D5008J.
(b)Remove lockwire and disconnect electrical connector D5012P from Channel A of right RVDT ans stow/deploy switch.
(c)Remove lockwire and disconnect electrical connector D5013P from Channel B of right RVDT and stow/deploy switch.
(d)Remove clamp (1), five clamps (2), eight clamps (3), three clamps (4), clamp (5) and attaching hardware.
(e)Remove wire harness.
(8)Remove wire harness (21W4069).
(a)Remove lockwire and disconnect electrical connector D5055J (D5054J RH reverser cowl) from D5055P (D5054P RH reverser cowl) (Ref. Fig. 406).

(b)Disconnect DH17 (DH16 for RH reverser cowl) from the shaft lock electrical connector (Ref. Fig. 406).
(c)Remove 13 clamps (3) and attaching hardware.
(d)Remove wire harness.

**ON A/C 101-200,

R

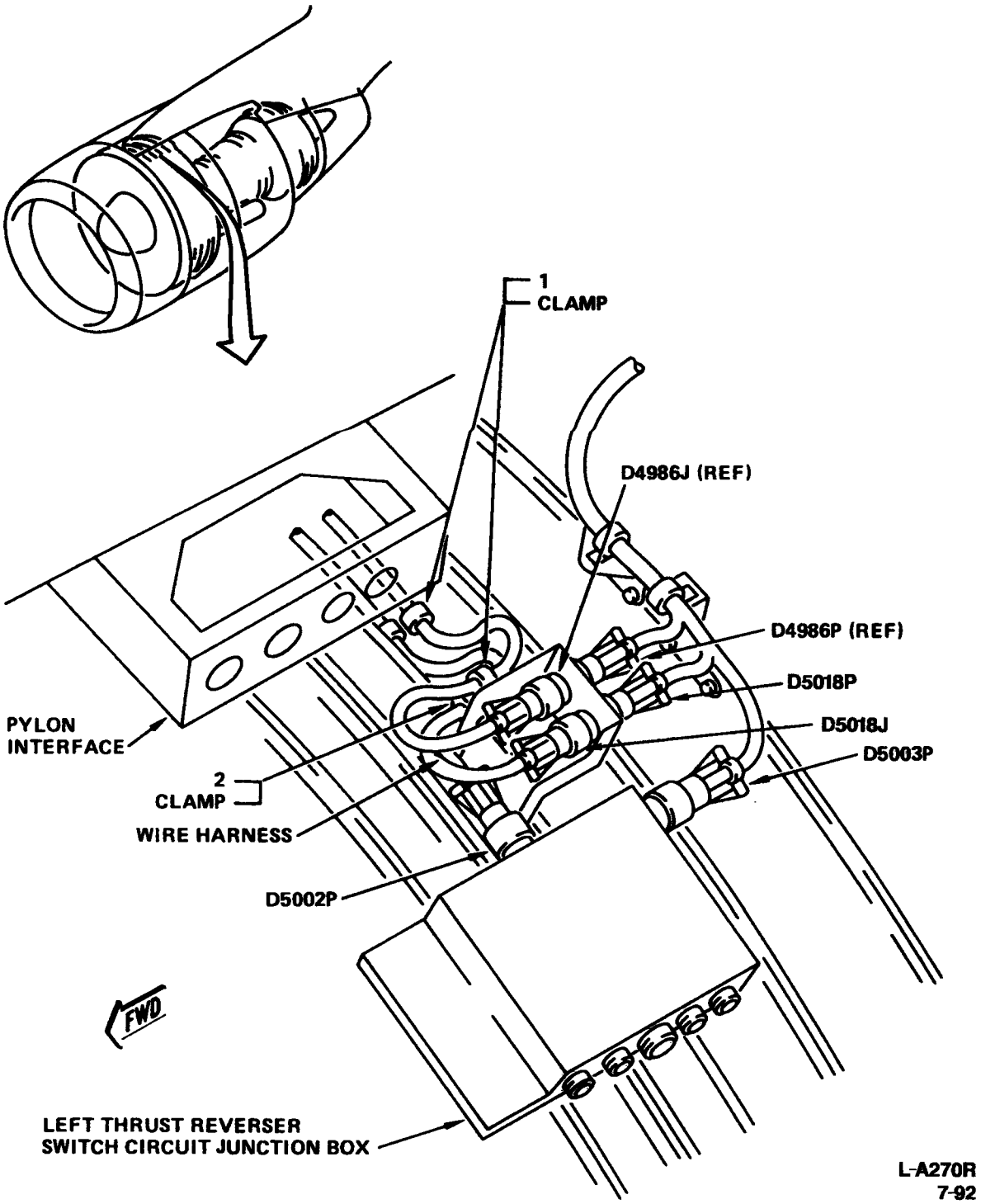
C. Installation

NOTE : The given torques are for new self-locking nuts.

(1)Install right RVDT and stow/deploy switch wire harness (21W4132).
(a)Align wire harness between electrical connector D5002J on left thrust reverser switch circuit junction box and connector D5008P on Flange B2 of right thrust reverser (Ref. Fig. 401, 405).

CAUTION : USE THE CORRECT ASSEMBLY PROCEDURE AND TOOLS FOR THE HARNESS CONNECTOR INSTALLATION (REF. 70-00-00, P. BLOCK 201). IF YOU USE THE INCORRECT ASSEMBLY PROCEDURE OR TOOLS, A DAMAGED OR LOOSE CONNECTOR CAN OCCUR. A LOOSE CONNECTOR PERMITS VIBRATION, WHICH CAN CAUSE THE CONTACTS TO WEAR AND UNSATISFACTORY LIGHTNING PROTECTION.

(b)Connect electrical connector D5002P to D5002J on left thrust reverser switch circuit junction box (Ref. Fig. 401). Tighten connector (Ref. 70-00-00, P. Block 201).
(c)Connect electrical connector D5008J to D5008P on Flange B2 of right fan case (Ref. Fig. 405). Tighten connector fingertight plus one-eighth turn and wirelock.
(d)Install electrical connector D5008J to wire support bracket. Install nuts fingertight plus one-quarter turn (Ref. Fig. 405).
(e)Install six clamps (1) and attaching hardware. TORQUE the nuts to between 24 and 27 lbf.in. (0.28 and 0.30 m.daN) (Ref. Fig. 401).
(2)Install wire harness (21W4140).
(a)Align wire harness between electrical connector D5011J on right thrust reverser switch circuit junction box and selector valve, PDU, and regulator/shutoff valve on left lower fan case (Ref. Fig. 402, 403).
(b)Connect electrical connector D5011P to D5011J on right thrust reverser switch circuit junction box (Ref. Fig. 403). Tighten connector fingertight plus one-eighth turn and wirelock.
(c)Connect electrical connector DH9 to regulator/shutoff valve on left lower fan case (Ref. Fig. 402). Tighten connector fingertight plus one-eighth turn and wirelock (Ref. Fig. 402).
(d)Connect electrical connector DS304 to PDU on left lower fan case (Ref. Fig. 402). Tighten connector fingertight plus one-eighth turn and wirelock.
(e)Connect electrical connector DH15 to selector valve on left lower fan case (Ref. Fig. 402). Tighten connector fingertight plus one-eighth turn and wirelock.
(f)Install four clamps (3) and attaching hardware (Ref. Fig. 403). TORQUE nut to between 24 and 27 lbf.in. (0.28 and 0.30 m.daN).



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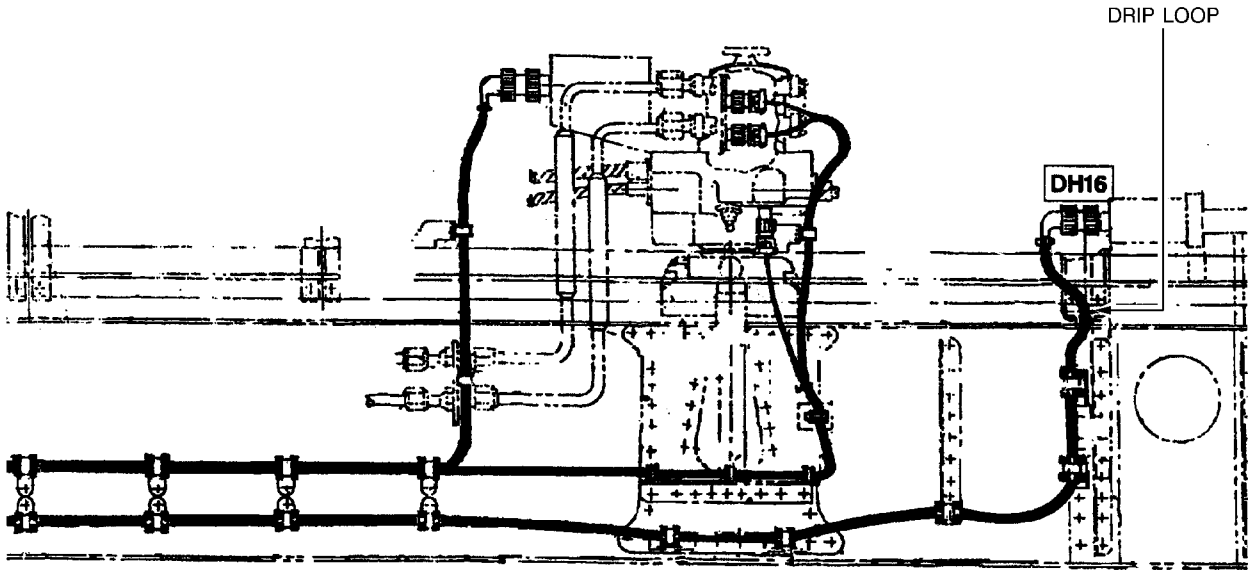
Thrust Reverser Electrical Wiring on Upper Left Fan Case
Figure 401



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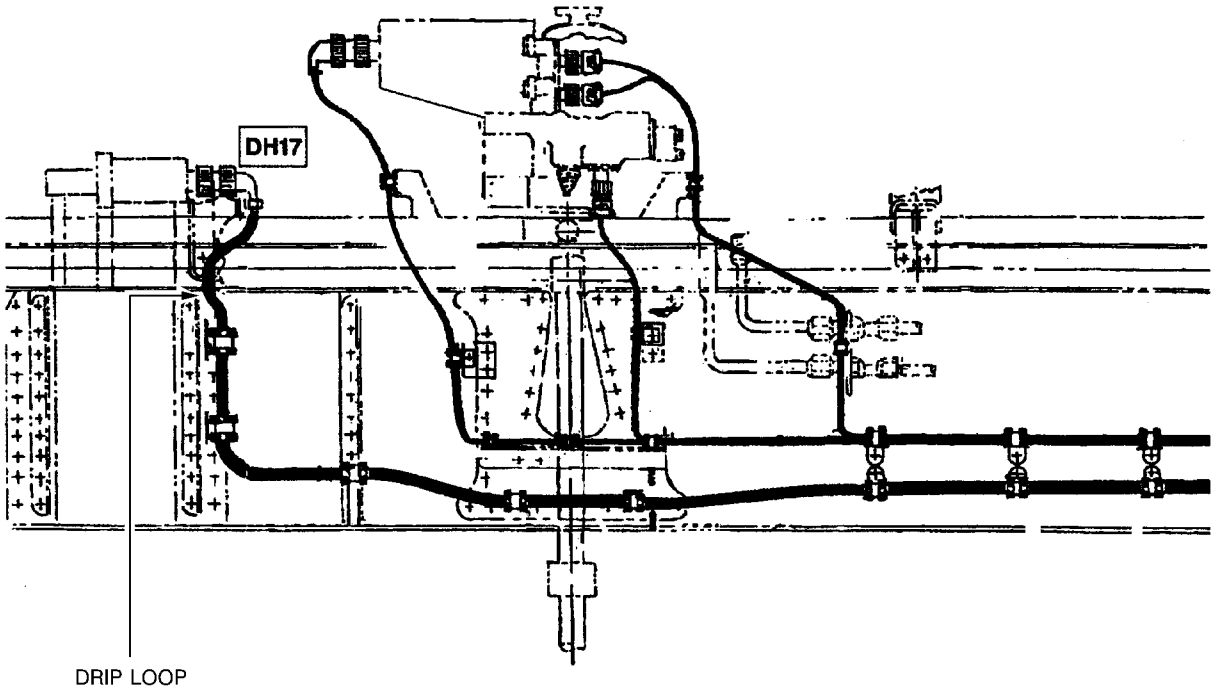
Thrust Reverser Electrical Wiring on Lower Left Fan Case
Figure 402



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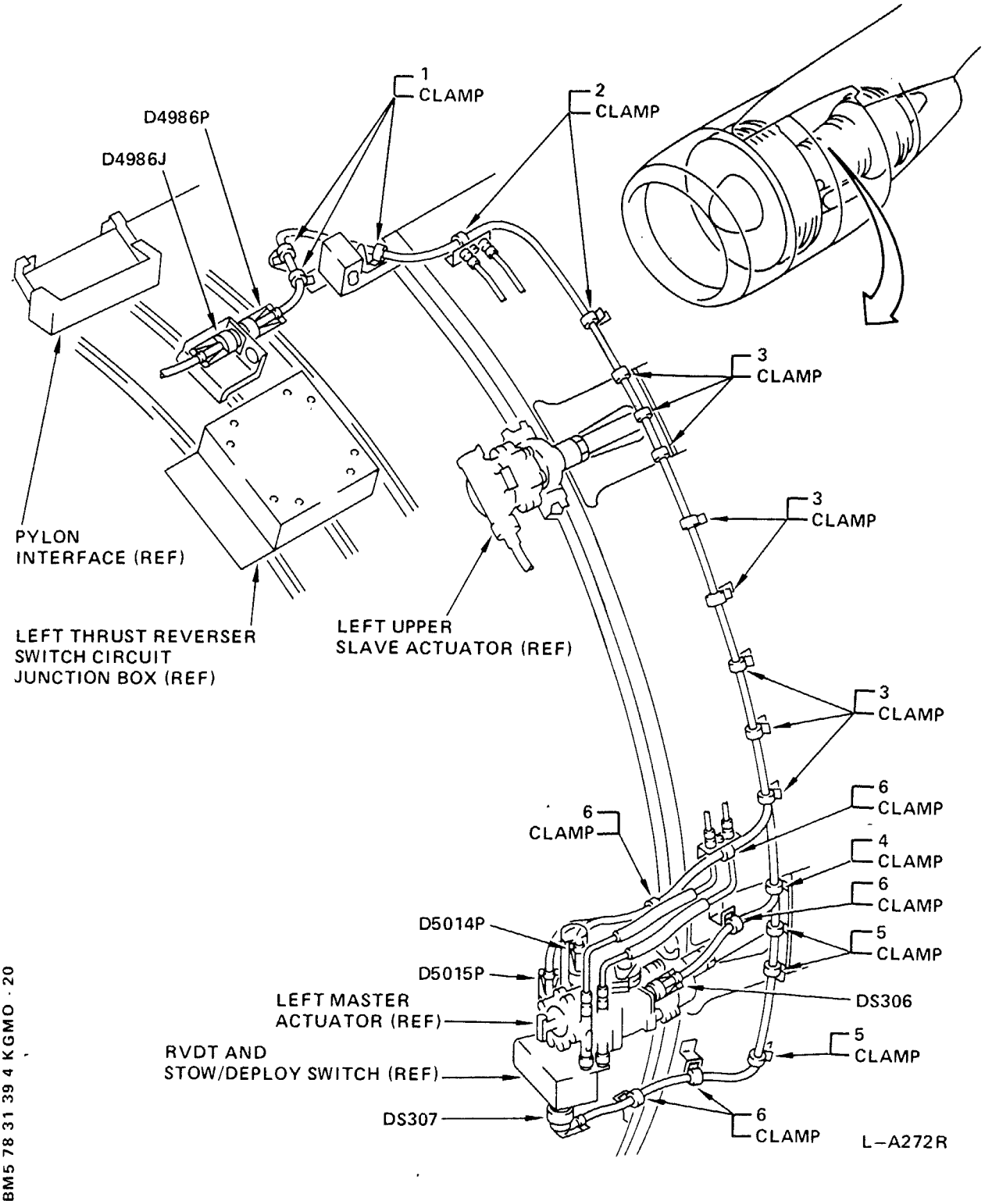
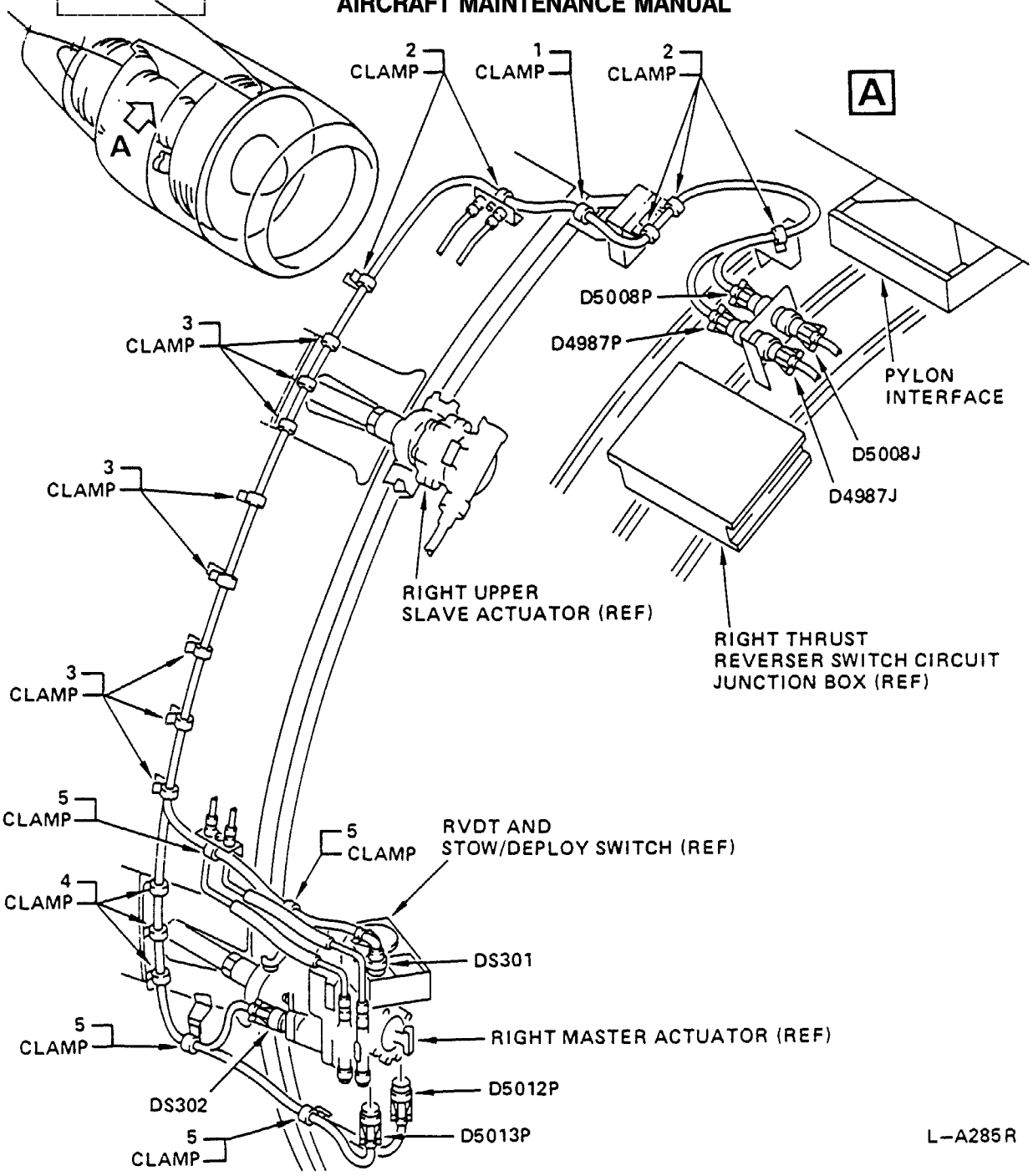
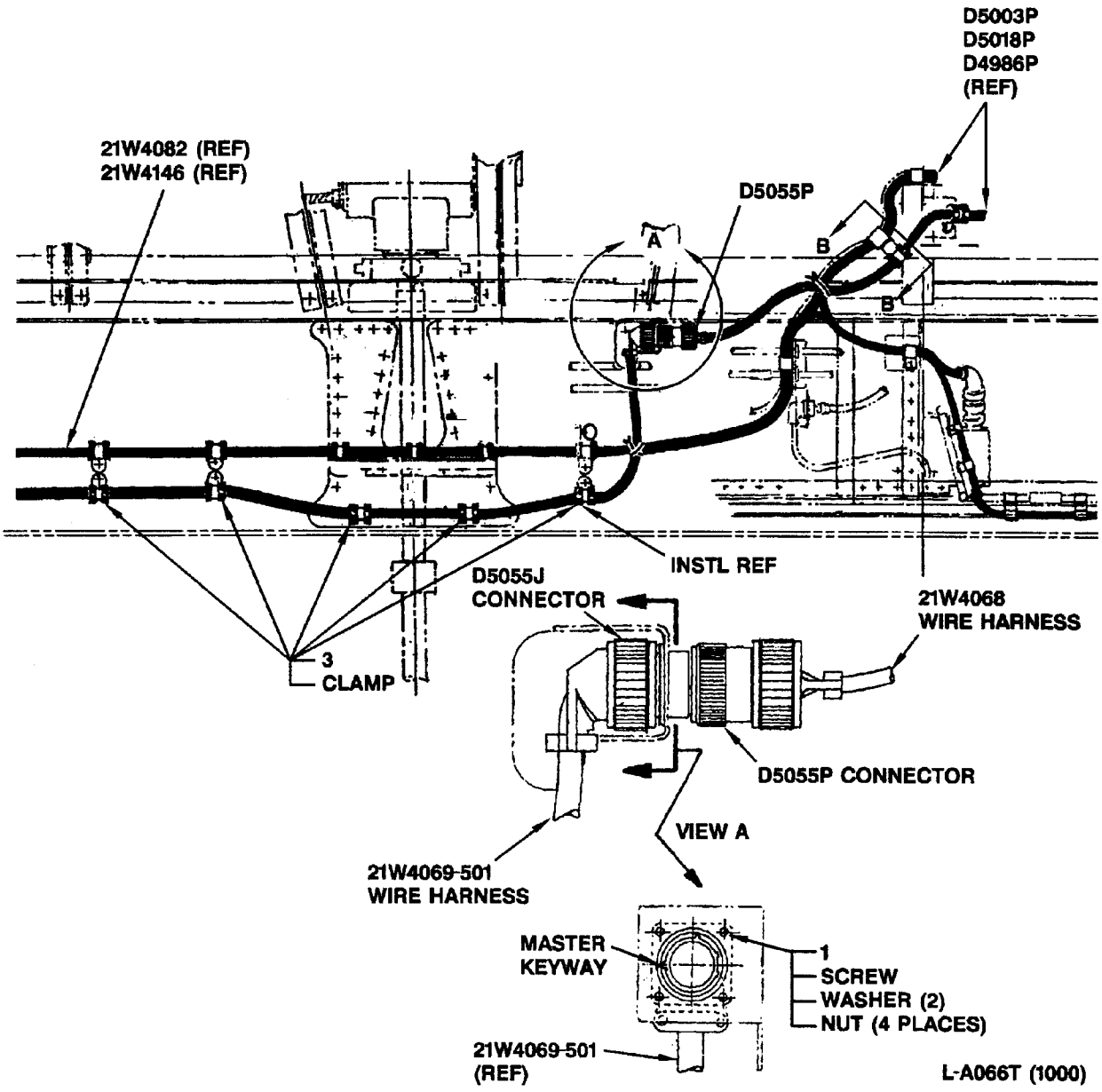
Thrust Reverser Electrical Wiring on Upper Right Fan Case
Figure 403



Thrust Reverser Electrical Wiring on Left Thrust Reverser
Figure 404



Thrust Reverser Electrical Wiring on Right Thrust Reverser
Figure 405



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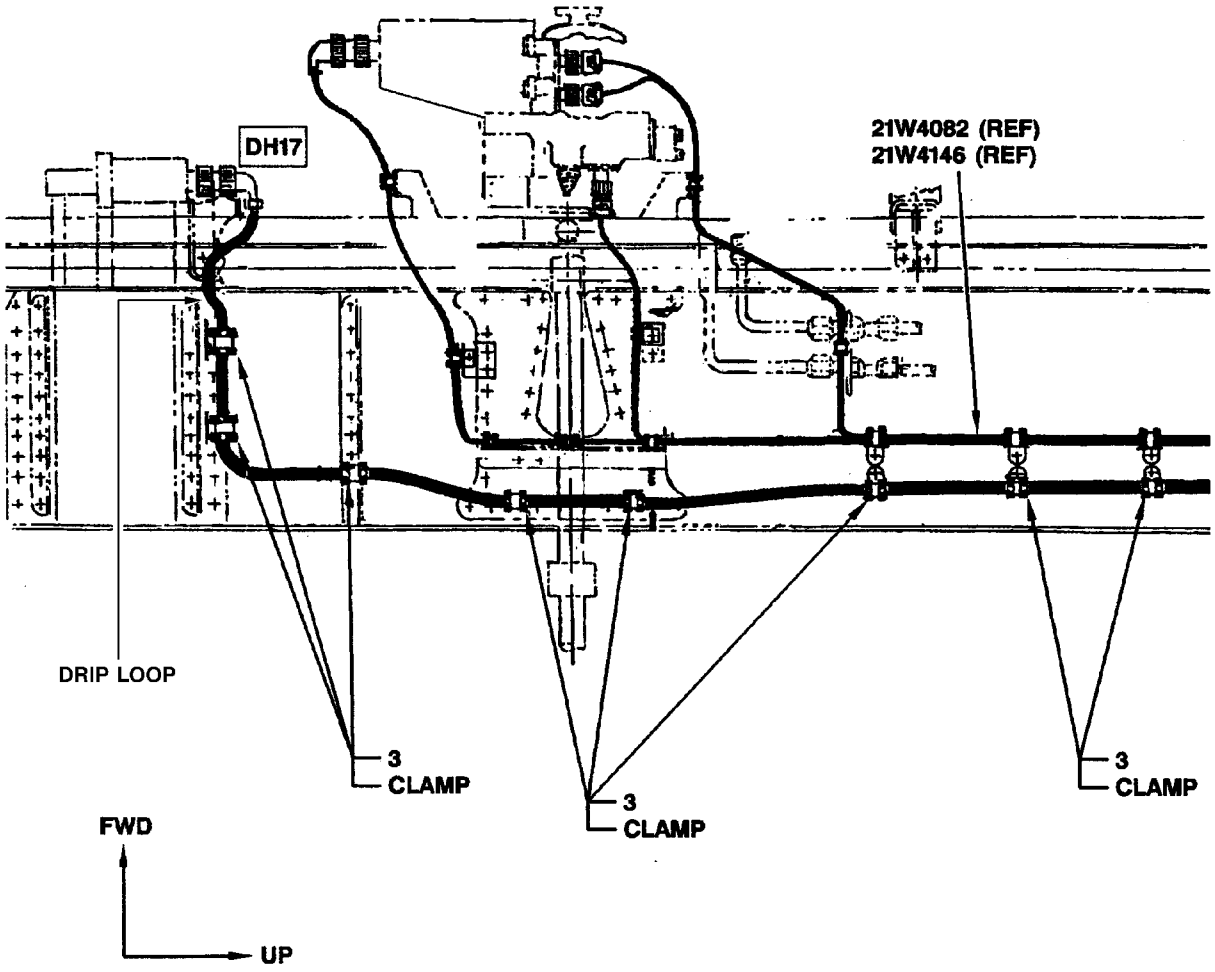
Thrust Reverser Electrical Wiring on Left Thrust Reverser
(Sheet 1/4)
Figure 406

R



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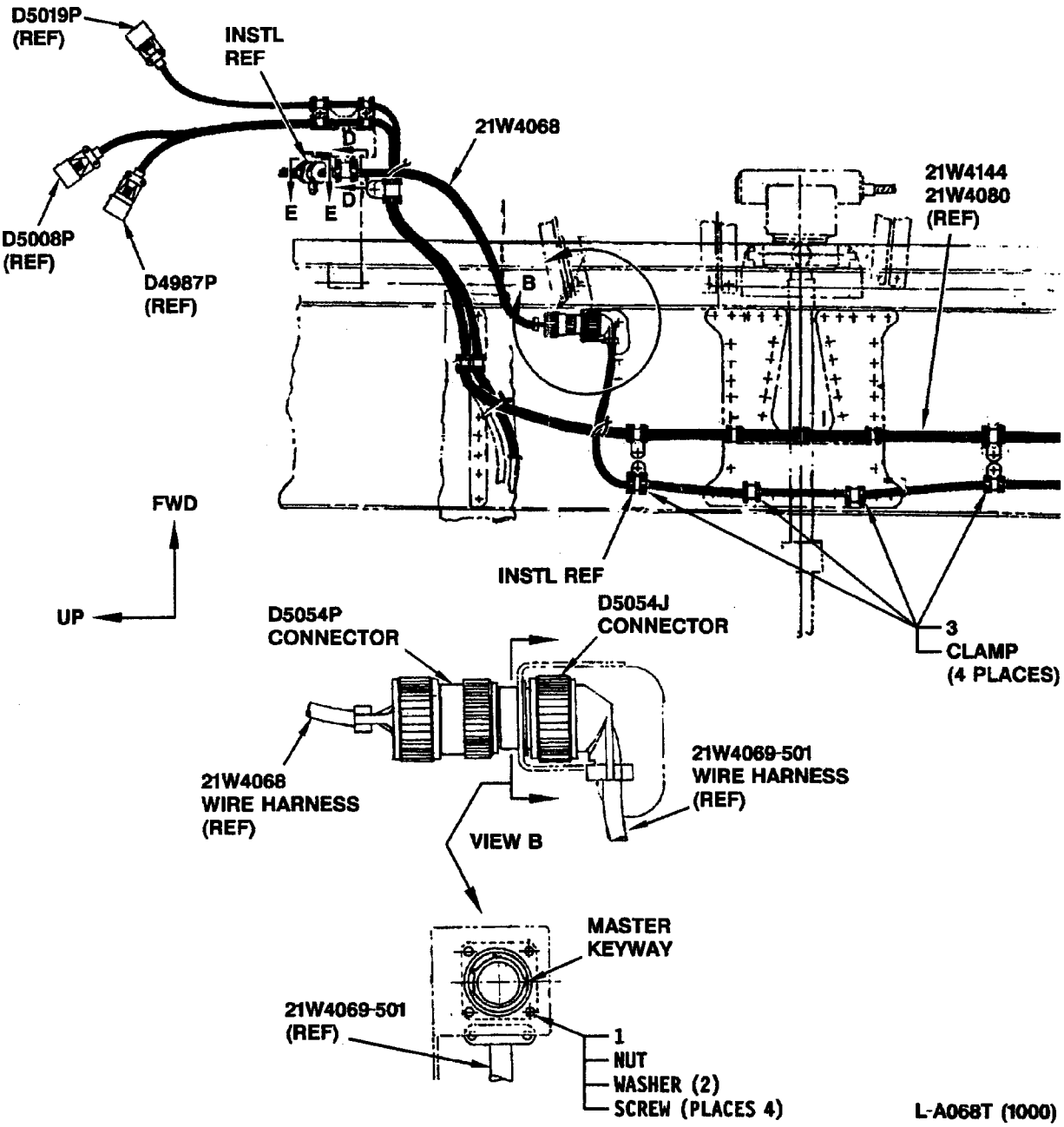
Thrust Reverser Electrical Wiring on Left Thrust Reverser
(Sheet 2/4)
Figure 406

R



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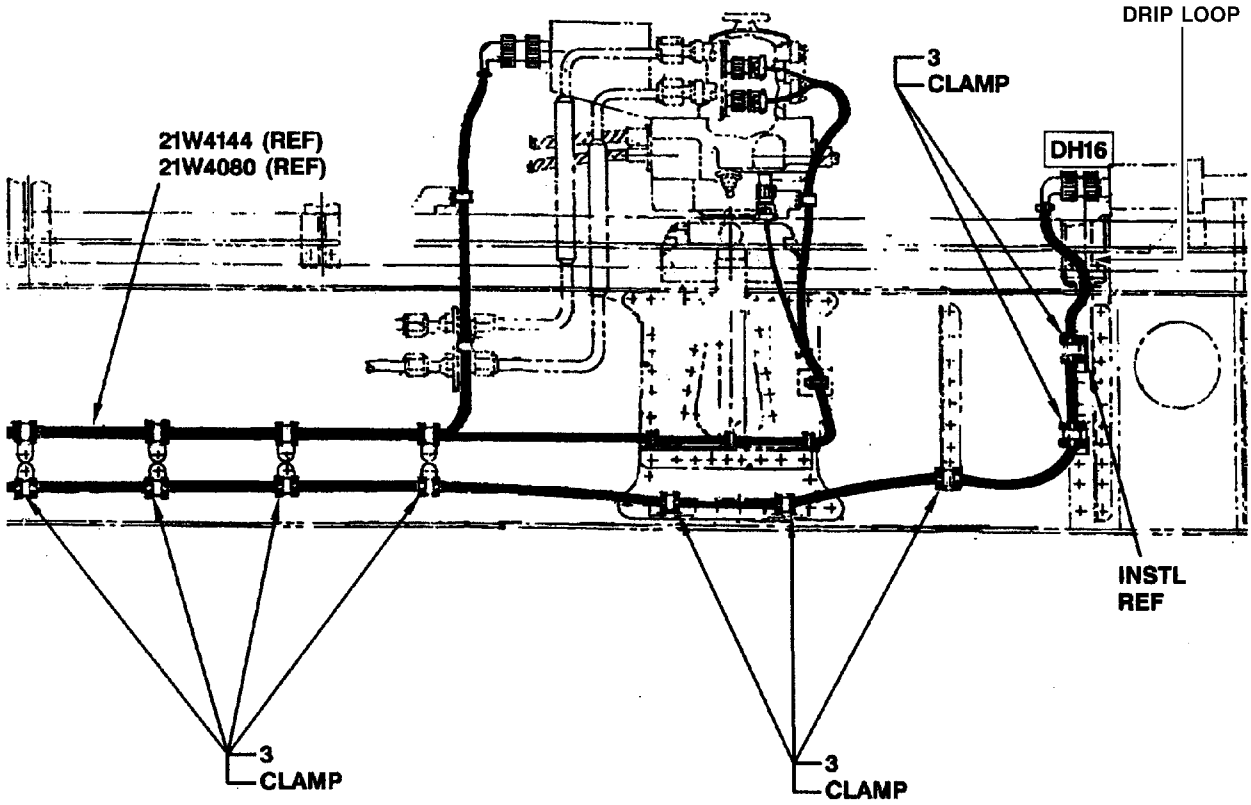
Thrust Reverser Electrical Wiring on Right Thrust Reverser
(Sheet 3/4)
Figure 406

R



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Thrust Reverser Electrical Wiring on Right Thrust Reverser
(Sheet 4/4)
Figure 406

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(g)Install two clamps (1), six clamps (2) and attaching hardware (Ref. Fig. 402). TORQUE nut to between 24 and 27 lbf.in. (0.28 and 0.30 m.daN).

(3)Install thrust reverser control wire harness (21W4076).

(a)Align wire harness between electrical connector D4986P on left fan case wire support bracket and right thrust reverser switch circuit junction box (Ref. Fig. 403, 404).

(b)Install electrical connector D4986J to the wire support bracket on the upper left hand fan case. Install nuts fingertight plus one-quarter turn (Ref. Fig. 401).

(c)Connect electrical connector D4986J to D4986P on left thrust reverser (Ref. Fig. 404). Tighten connector fingertight plus one-eighth turn and wirelock.

(d)Connect electrical connector D4966P to right pylon interface (Ref. Fig. 403). Tighten connector fingertight plus one-eighth turn and wirelock.

(e)Install electrical connector D4987J to the wire support bracket on the upper right hand fan case. Install the nuts fingertight plus one-quarter turn (Ref. Fig. 403).

(f)Connect electrical connector D4987J to D4987P on right upper fan case (Ref. Fig. 403). Tighten connector fingertight plus one-eighth turn and wirelock.

(g)Connect electrical connectors D5006P, D5010P, and D5007P to right thrust reverser switch circuit junction box (Ref. Fig. 403). Tighten connectors fingertight plus one-eighth turn and wirelock.

(h)Install two clamps (1) and attaching hardware (Ref. Fig. 401). TORQUE nut to between 24 and 27 lbf.in. (0.28 and 0.30 m.daN).

(i)Install four clamps and attaching hardware on flange B1 from right to left across the top of the fan case. TORQUE the nuts to between 24 and 27 lbf.in. (0.28 and 0.30 m.daN).

(j)Install clamp (1), three clamps (2) and attaching hardware (Ref. Fig. 403). TORQUE nut to between 24 and 27 lbf.in. (0.28 and 0.30 m.daN).

(4)Install wire harness (21W4082) (Ref. Fig. 404).

(a)Align wire harness between electrical connector D4986J and secondary lock switch and stow/deploy switch on master actuator.

(b)Connect electrical connector D4986P to D4986J. Tighten connector fingertight plus one-eighth turn and wirelock.

(c)Connect electrical connector DS306 to secondary lock switch on master actuator. Tighten connector fingertight plus one-eighth turn and wirelock.

(d)Connect electrical connector DS307 to stow/deploy switch on master actuator. Tighten connector fingertight plus one-eighth turn and wirelock.

(e)Connect DV227 (DV229 for nacelle cooling system in poppet valve configuration) to the electrical connector on left hand inner barrel cooling duct shut-off valve. Tighten the connector fingertight plus one-eighth turn and wirelock. Install clamps (Ref. 75-25-03, P. Block 401).

(f)Install three clamps (1), five clamps (2), eight clamps (3), one clamps (4), two clamps (5), four clamps (6) and attaching hardware.

TORQUE nut to between 24 and 27 lbf.in. (0.28 and 0.30 m.daN).

(5)Install wire harness (21W4146) (Ref. Fig. 404).
  (a)Align wire harness between eletrical connector D5003J on left thrust reverser switch circuit junction box and RVDT and stow/deploy switch on left master actuator (Ref. Fig. 401)
  (b)Connect electrical connector D5003P to D5003J on left thrust reverser switch circuit junction box, (Ref. Fig. 401). Tighten connector fingertight plus one-eighth turn and wirelock.
  (c)Connect electrical connector D5014P to Channel A of RVDT and stow/deploy switch on master actuator. Tighten connector fingertight plus one-eighth turn and wirelock.
  (d)Connect electrical connector D5015P to Channel B of RVDT and stow/deploy switch on master actuator. Tighten connector fingertight plus one-eighth turn and wirelock.
  (e)Install three clamps (1), two clamps (2), eight clamps (3), two clamps (6) and attaching hardware. TORQUE nut to between 24 and 27 lbf.in. (0.28 and 0.30 m.daN).

(6)Install wire harness (21W4080) (Ref. Fig. 405).
  (a)Align wire harness between electrical connector D4987J and stow/deploy switch and secondary lock switch on master actuator.
  (b)Connect electrical connector D4987P to D4987J. Tighten connector fingertight plus one-eighth turn and wirelock.
  (c)Connect electrical connector DS301 to stow/deploy switch on master actuator. Tighten connector fingertight plus one-eighth turn and wirelock.
  (d)Connect electrical connector DS302 to secondary lock switch on master actuator. Tighten connector fingertight plus one-eighth turn and wirelock.
  (e)Connect DV228 (DV230 for nacelle cooling system in poppet valve configuration) to the electrical connector on left hand inner barrel cooling duct shut-off valve. Tighten the connector fingertight plus one-eighth turn and wirelock. Install clamps (Ref. 75-25-03, P. Block 401).
  (f)Install clamp (1), five clamps (2), eight clamps (3), three clamps (4), four clamps (5) and attaching hardware. TORQUE nut to between 24 and 27 lbf.in. (0.28 and 0.30 m.daN).

(7)Install wire harness (21W4144) (Ref. Fig. 405).
  (a)Align wire harness between electrical connector D5008J and RVDT stow/deploy switch on master actuator.
  (b)Connect electrical connector D5008P to D5008J. Tighten connector fingertight plus one-eighth turn and wirelock.
  (c)Connect electrical connector D5012P to Channel A of RVDT and stow/deploy switch on master actuator. Tighten connector fingertight plus one-eighth turn and wirelock.
  (d)Connect electrical connector D5013P to Channel B of RVDT and stow/-deploy switch on master actuator. Tighten connector fingertight plus one-eighth turn and wirelock.
  (e)Install clamp (1), five clamps (2), eight clamps (3), three clamps (4), four clamps (5) and attaching hardware. TORQUE nut between 24 and 27 lbf.in. (0.28 and 0.30 m.daN).

(8)Install wire harness (21W4069) (Ref. Fig. 406).

NOTE : At locations where clearance between wire harnesses, flexshafts and components is considered marginal, the proper installation of the harness and individual routing/installation of components must be reconfirmed. If clearance is still considered marginal after reconfirming proper installation and routing, it is recommended that the wire harnesses or flexshafts be wrapped with protective tape to provide additional protection and prevent chafing.

(a)Align the wire harness between the electrical connector D5054P (D5055P for the left hand) and the shaft lock electrical connector DH16 (DH17 for the left hand).

(b)Connect the DH16 (DH17 for the left hand) to the shaft lock electrical connector. Tighten connector fingertight plus one-eighth turn.

(c)Install electrical connector D5054J (D5055J for the left hand) to the wire support bracket on the thrust reverser. Install nuts fingertight plus one-quarter turn.

(d)Connect electrical connector D5054P (D5055P for the left hand) to D5054J. Tighten the connector fingertight plus one-eighth turn. Do a drip loop with harness at DH16 (DH17 for the left hand) location.

(e)Install thirteen clamps (3) and attaching hardware. TORQUE the nuts to between 24 and 27 lbf.in. (0.28 and 0.30 m.daN).

**ON A/C 101-200,

R

E. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(2)Remove access platform.

(3)Close fan cowl doors (Ref. 71-13-00, P. Block 301).

(4)Remove safety clips and tags and close circuit breakers :
for engine 1 : 1KM, 3KM, 45KM, 35KS, 37KS,
for engine 2 : 2KM, 4KM, 44KM, 34KS, 36KS.

(5)Perform operational test (Ref. 78-32-11, P. Block 501).

RVDT AND STOW/DEPLOY SWITCH ASSEMBLY - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breaker Safety Clips
C.	Torque Wrench
D.	Protective Covers
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-31-40, P. Block 501	RVDT and Stow/Deploy Switch Assembly

2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

PANEL	SERVICE	IDENT.	LOCATION
FOR ENGINE 1			
133VU	ENGINES/ENG1 REVERSE CTL	1KM	332/U69
133VU	ENGINES/ENG1 REVERSE WARN	3KM	332/U68
133VU	ENG1/SCU SUPPLY GND	35KS	333/T76
133VU	ENG1/SCU SUPPLY FLT	37KS	333/T75
FOR ENGINE 2			
133VU	ENGINES/ENG2 REV CTL	2KM	331/V74
133VU	ENGINES/ENG2 REV WARN	4KM	331/V73
133VU	ENG2/SCU SUPPLY GND	34KS	333/T85
133VU	ENG2/SCU SUPPLY FLT	36KS	333/T84

WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2)Position access platform.

(3)Open fan cowl doors (Ref. 71-13-00, P. Block 301).

(4)Ensure that ground air duct is not connected to air shutoff valve.

B. Removal (Ref. Fig. 401)

(1)Disconnect connector DS307 (DS301 right side).

(2)Disconnect connector D5014P and D5015P (D5012P and D5013P right side).

(3)Install protective covers on connectors.

CAUTION : WHEN REMOVING THE RVDT SWITCH ASSEMBLY MAKE CERTAIN THE SWITCH ASSEMBLY REMAINS IN THE STOW POSITION. VERIFY THAT THE SWITCH ASSEMBLY CAM SHAFT VISUAL INDICATOR IS ALIGNED ON THE STOW STOP LINE.

(4)Remove four bolts and washers attaching switch assembly to master actuator.

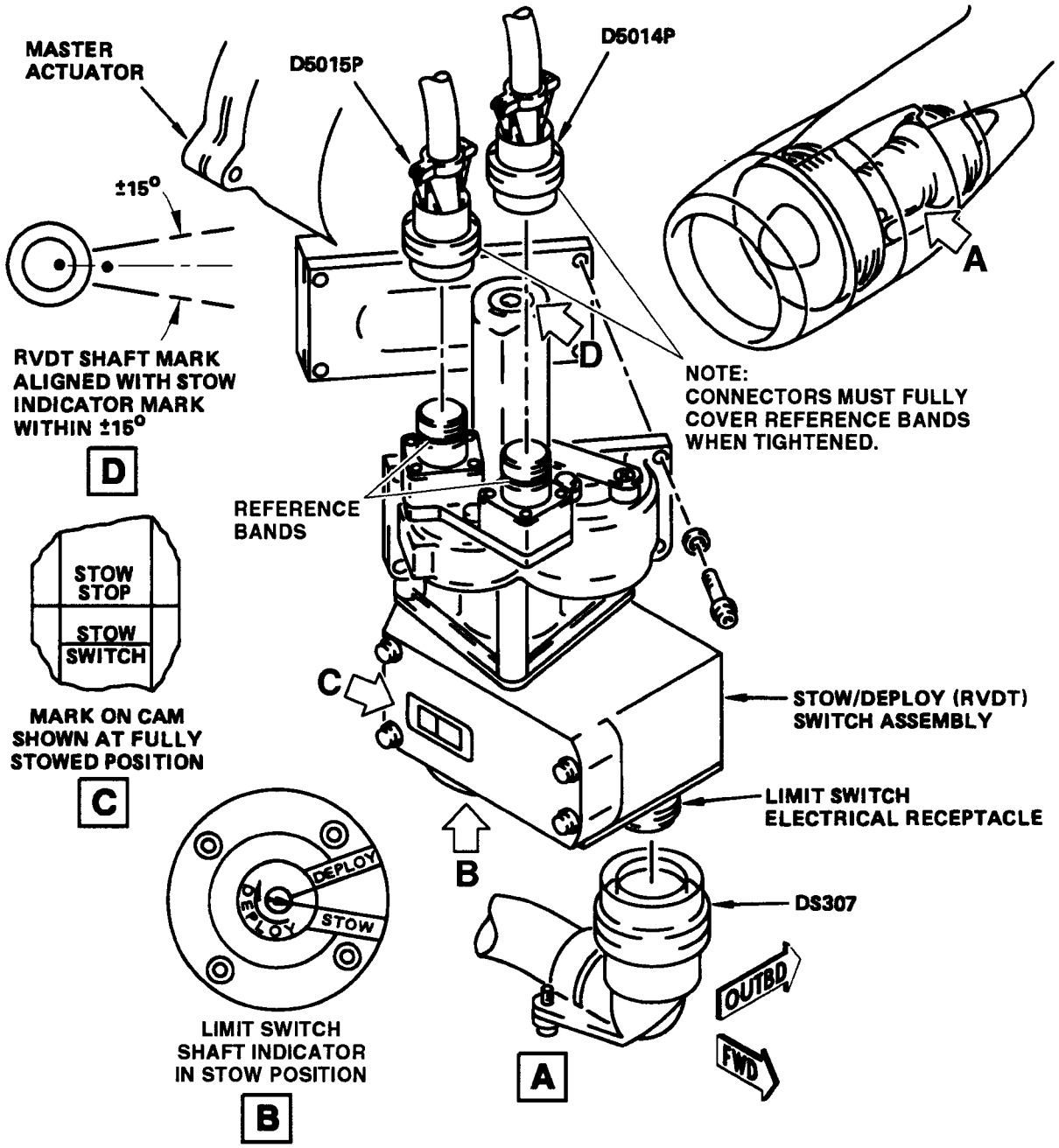
(5)Carefully remove switch assembly from master actuator ensuring switch

assembly remains in stow position.
(6)Position protective cover plate (PN 3234416-3) on RVDT switch assembly so that anti-rotation pin (mounted to cover plate) is positioned between two teeth on input gear.
(7)Attach cover plate to switch assembly with four bolts and washers and tighten bolts handtight.
(8)Install protective cover plate (PN 3234416-2) on master actuator, where switch assembly has been removed, with four bolts and washers. Tighten bolts handtight.

C. Installation
NOTE : The RVDT and Stow/Deploy Switch Assembly is installed on the master actuator in the fully stowed position.
(1)Manually drive the translating sleeve to the fully stowed position. Verify that the master actuator secondary lock position indicator is at the extreme edge of the brake release zone (Ref. 78-32-11, P. Block 201).
NOTE : Since the actuators tend to back off their stops, it will be necessary to manually hold actuators on stops until completion of step (3).
R (2)Remove shipping cover (PN 3234416-3) which holds switch assembly in stowed position. Verify that switch assembly is at its fully stowed position.
(a)Ensure STOW STOP line on cam is aligned with visual indicator line.
(b)Ensure limit switch shaft arrow is aligned with stow index line.
(c)Ensure RVDT shaft mark is aligned with stow indicator mark.
(3)If above conditions are not met, rotate input gear until indicator marks are aligned. Do not rotate the gear so far that shaft indicator moves clockwise past DEPLOY index line or counterclockwise past STOW index line.
(4)Remove four bolts and washers attaching protective shipping cover (PN 3234416-2) to master actuator.
(5)Using same four bolts and washers, install switch assembly on master actuator. Do not allow RVDT switch input gear to rotate while assembly is being handled and installed. TORQUE bolts to between 50 and 70 lbf.in. (0.57 and 0.79 m.daN).
(6)Remove protective covers from connectors.
CAUTION : MAKE SURE THE RVDT CONNECTORS ARE PROPERLY RE-CONNECTED. A LOOSE OR FREE CONNECTOR CAN CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.
(7)Connect D5014P and D5015P (D5012P and D5013P on right sides). Tighten connector fingertight plus 1/8 turn.
CAUTION : MAKE SURE THE RVDT CONNECTOR IS PROPERLY RE-CONNECTED. A LOOSE OR FREE CONNECTOR CAN CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.
(8)Connect connector DS307 (DS301 on right side). Tighten connector fingertight plus 1/8 turn.

D. Test
(1)Perform test (Ref. 78-31-40, P. Block 501).

E. Close-Up



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L-A138R (0308)
PW C

R RVDT and Stow/Deploy Switch Assembly
Figure 401

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Remove access platform.
(3)Close fan cowl door (Ref. 71-13-00, P. Block 301).
(4)Remove safety clips and tags and close circuit breakers : 1KM, 3KM, 35KS, 37KS, 2KM, 4KM, 34KS, 36KS.

RVDT AND STOW/DEPLOY SWITCH ASSEMBLY - ADJUSTMENT/TEST

1. Equipment and Materials

ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breaker Safety Clips
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 73-38-00, P. Block 501	FADEC System Indicating
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves

2. Procedure

A. Job Set-Up

(1) Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).

WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2) Position access platform

(3) Ensure that ground air duct is not connected to air shutoff valve.

B. Adjustement/Test (Ref. Fig. 501)

(1) Disconnect connector DS307 (DS301 right side).

(2) With reverser fully stowed, verify that the STOW STOP line on the cam aligns with the visual indicator.
At the limit switch electrical receptacle (Ref. Fig. 501) verify that there is no continuity between pins 3 and 4 and pins 5 and 6. Also, verify that there is continuity between pins 7 and 8. Monitor pins 3 and 4 as the reverser is slowly manually deployed (Ref. 78-32-11, P. Block 201). Continuity must be made between these pins at 3 - 6 revolutions of the input drive.

(3) Continue to drive the reverser to fully deployed position while monitoring pins 1 and 8 of the limit switch receptacle. Note the point where continuity is made between pins 1 and 8. This must occur at 20 - 37 input revolutions before the actuator stops at fully deployed position.

(4) From fully deploy position, drive the reverser 7 1/2 revolutions toward stow position so that it is located at the nominal deployed position. Verify that the limit switch shaft indicator aligns with the DEPLOY index line.

(5) Slowly drive the reverser toward stow position while monitoring pins 1 and 8. Continuity between these pins must break within 12 - 42 input drive revolutions from nominal deploy toward stow.

(6) Continue to drive the reverser to fully stowed position while monitoring pins 3 and 4. Continuity between these pins must break at 2 - 6 input revolutions before the actuator stops at the fully stowed position. With the reverser fully stowed, verify that the STOW STOP line aligns with the visual indicator line.

(7)Remove protective covers from connectors.

CAUTION : MAKE SURE THE RVDT CONNECTOR IS PROPERLY RE-CONNECTED. A LOOSE OR FREE CONNECTOR CAN CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(8)Connect connector DS307 (D301 on right side). Tighten connector finger-
R tight plus 1/8 to 1/4 turn.
R NOTE : The connectors will be fully on the reference bands on the
R receptacles when the connectors are correctly tightened.

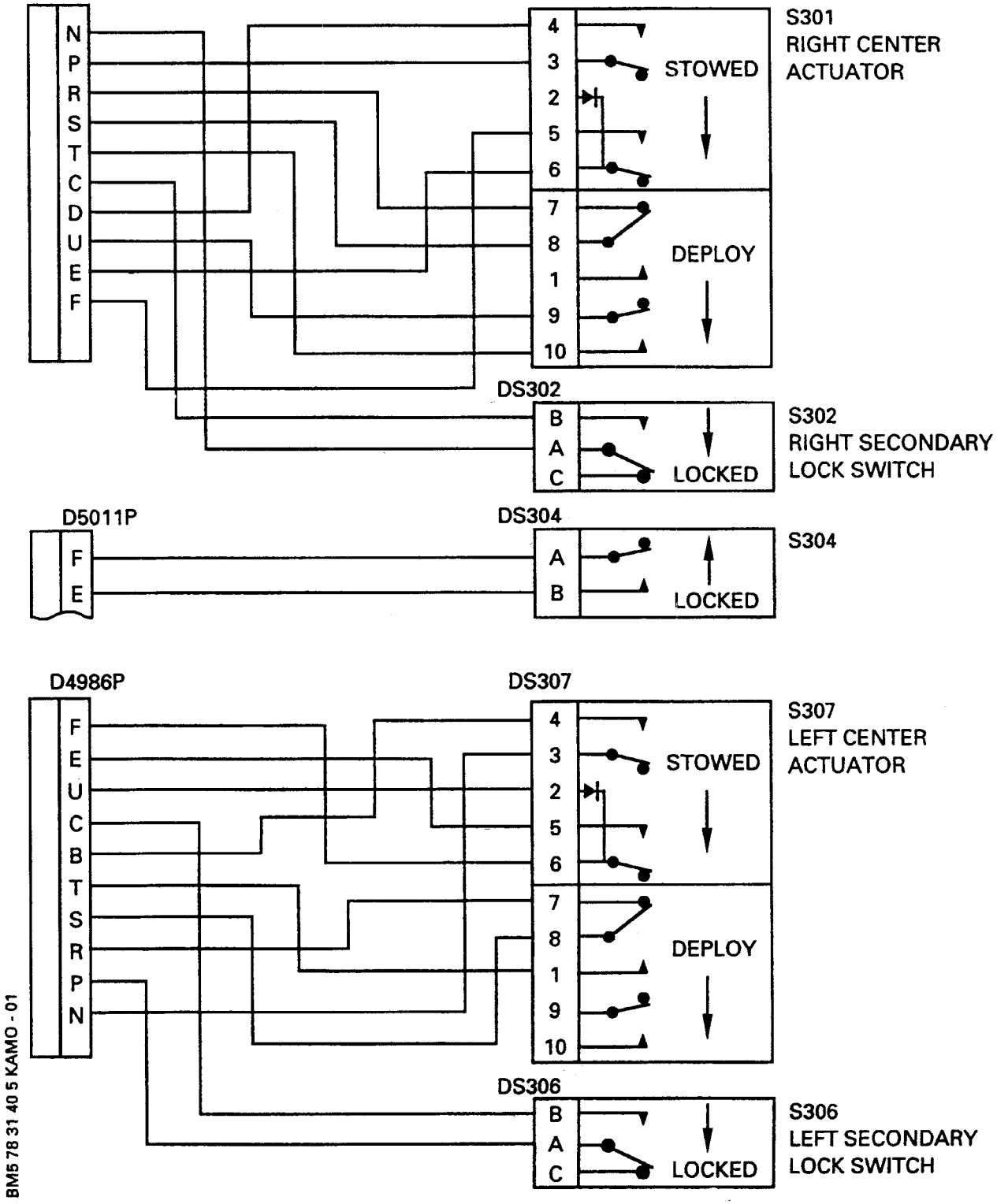
(9)Verify that the FADEC Ground test display is available on the right ECAM (Ref. 73-38-00, P. Block 501). On the right ECAM FADEC Ground test display, verify that REV percent is 0 percent ± 2 percent for CH A and CH B.

C. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(2)Remove access platform.

(3)Close fan cowl door. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



Stow/Deploy Limit Switches Circuit Diagram
Figure 501

**ON A/C 101-200,

SYNCHRONOUS SHAFT LOCK ASSEMBLY - REMOVAL/INSTALLATION

1. General

NOTE : These instructions are identical for left or right hand thrust reverser halves.

2. Equipment and Material

ITEM	DESIGNATION
A.	Blanking Cap
B.	Protective Cover (Special Tape or equivalent)
C.	Protection
D. Material No. P03-014	Oils (Ref. 70-00-00)
E. Material No. P05-332	Special Materials (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-00, P. Block 501	Thrust Reverser System Control
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

3. Procedure

A. Job Set-Up

CAUTION : DISCONNECT THE AIR POWER SUPPLY BEFORE REMOVING OR INSTALLING THE THRUST REVERSER SYNCHRONOUS SHAFT LOCK AND FLEX SHAFTS. DO NOT ATTEMPT TO MANUALLY MOVE TO THE SLEEVES WHEN AN AIR SUPPLY IS CONNECTED TO THE PNEUMATIC DRIVE UNIT (PDU). A POWER SURGE COULD CAUSE SERIOUS INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).

R B. Removal (Ref. Fig. 401, 402, 403)

CAUTION : REMOVAL OF THE SYNCHRONOUS SHAFT LOCK UNIT FROM THE SUPPORT BRACKET IS REQUIRED TO PROPERLY DISENGAGE THE FLEXIBLE SHAFT BETWEEN THE MASTER ACTUATOR AND THE SYNCHRONOUS SHAFT LOCK ASSEMBLY. FAILURE TO REMOVE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY MAY RESULT IN PERMANENT DAMAGE TO THE FLEXIBLE SHAFT.

NOTE : Make sure the synchronous shaft lock unit handle is in the UNLOCKED position prior to removal of the synchronous shaft lock unit.

R (1)Disconnect the DH16 (DH17) electrical connector (13) from the receptacle
R on the synchronous lock assembly (12).
R (2)Remove the lockwire from the flex shaft cover plates at four locations
R (upper and lower flex shaft connection points).
R (3)(Pre SB PW4NAC 78-120) Remove the P-clamp (1), the bolt (2) and the
R washer (14) from the clamp support bracket to allow greater range of

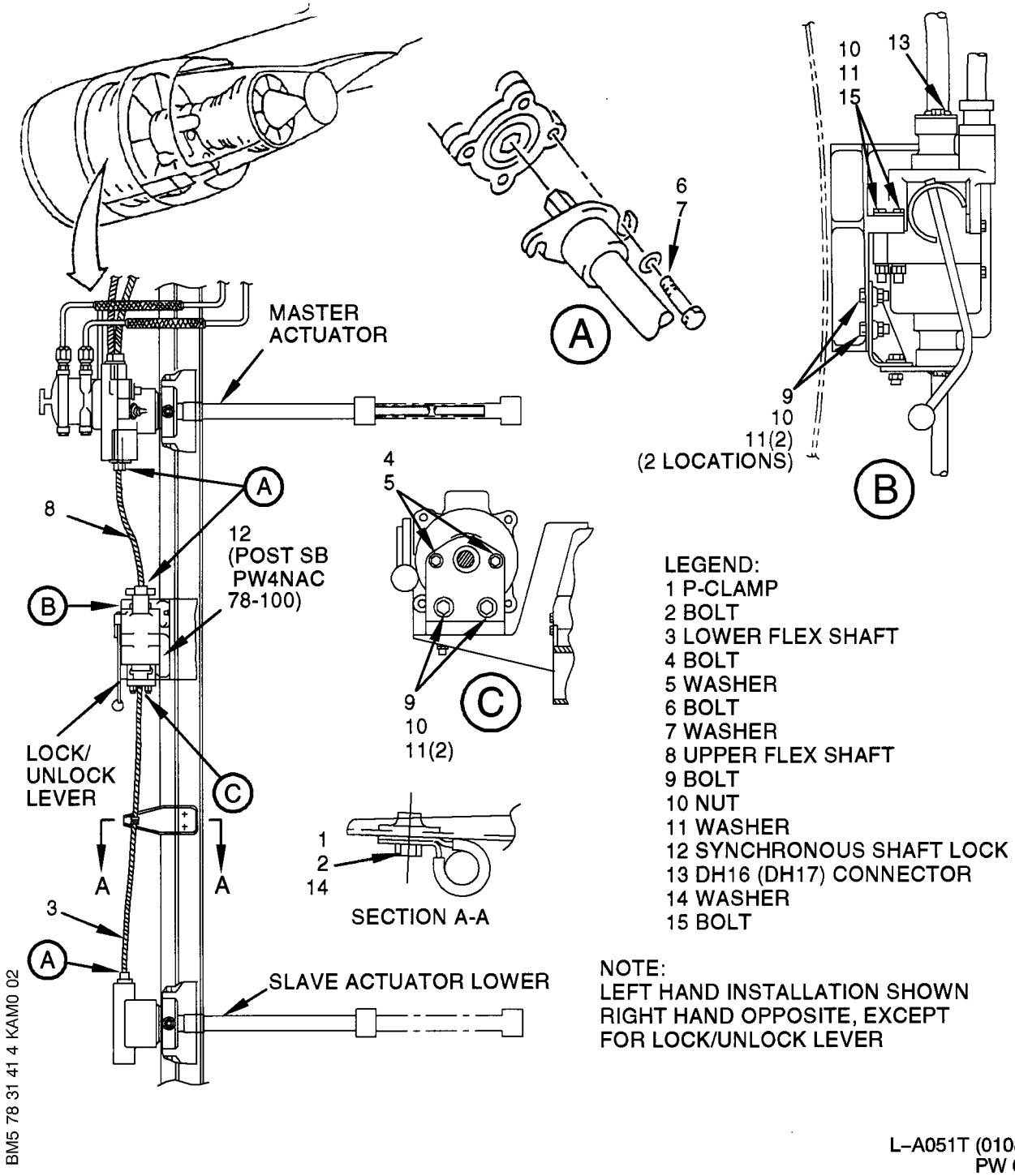
R motion of the lower flex shaft (3). Retain attaching hardware on the
R lower flex shaft for reinstallation.
R (4)(Post SB PW4NAC 78-120) Remove the P-clamp (1), the bolt (2), the
R washers (14) and the nut (10) from the clamp support bracket to allow
R greater range of motion of the lower flex shaft (3). Retain attaching
R hardware on the lower flex shaft for reinstallation.
R (5)Remove the bolts (4), washers (5), bolts (9), washers (11), and nuts (10)
R (two places) which attach the flange to the lower end of the synchronous
R shaft lock unit at the lower flex shaft (3). At the lower slave actuator,
R remove the bolt (6) and washer (7). Disconnect both ends of the lower
R flex shaft from the synchronous shaft lock unit and the lower slave
R actuator. Retain hardware for reinstallation. Remove the lower flex
R shaft.
R NOTE : Make sure a clean work area is available to place the flex shafts.
R Do not permit any debris to contact the flex shafts.
R (6)Install protective covers on the orifice on the top of the slave actuator
R to prevent contamination of the actuation system.
R (7)Remove the bolts (6) and washers (7) that attach flexible shaft flange
R to each end of the flexible shaft (8) between the lower side of the
R master actuator and the upper side of the synchronous shaft lock
R assembly.
R CAUTION : REMOVAL OF THE SYNCHRONOUS SHAFT LOCK UNIT FROM THE SUPPORT
R BRACKET IS REQUIRED TO PROPERLY DISENGAGE THE FLEXIBLE SHAFT
R BETWEEN THE MASTER ACTUATOR AND THE SYNCHRONOUS SHAFT LOCK
R ASSEMBLY. FAILURE TO REMOVE THE SYNCHRONOUS SHAFT LOCK ASSEMBLY
R MAY RESULT IN PERMANENT DAMAGE TO THE FLEXIBLE SHAFT.
R (8)While carefully supporting the synchronous shaft lock assembly, remove
R two bolts (9) or (16), washers (11), nuts (10) (two places), bolts (15),
R washers (11) and nuts (10) that attach the synchronous shaft lock
R assembly to the thrust reverser torque box support bracket. Retain all
R the hardware for reinstallation.
R (9)Disengage both ends of the upper flexible shaft from the synchronous
R lock assembly and master actuator drive ports. Remove the flexible shaft.
R Secure the flexible shaft core to housing with lockwire to prevent
R separation from housing and possible flexible shaft contamination.
R (10)Install protective covers on the drive ports on both sides of the
R synchronous lock assembly and to the lower side of the master actuator.

R C. Installation (Ref. Fig. 401, 402, 403)
R CAUTION : MAKE SURE THERE ARE NO BENDS OR CURVES IN UPPER FLEX SHAFT (8)
R OR LOWER FLEX SHAFT (3) FOR THE POST SB PW4NAC 78-120
R CONFIGURATION. BENDS OR CURVES IN THE FLEX SHAFT CAN CAUSE
R FATIGUE OF THE INNER CORE, WHICH CAN CAUSE THE THRUST REVERSER
R TO FAIL TO OPERATE.
NOTE : The synchronous shaft lock installation is identical on both the
R left and right halves of the thrust reverser except as noted. The
synchronous shaft lock lever will be on the forward face on left
hand installations and on the aft face on the right hand
installations.
R (1)Remove the protective covers from the master actuator, slave actuator and
R the synchronous lock unit. Lightly apply Material No.P03-014 to both

R synchronous shaft lock bores.
R (2)Position the synchronous shaft lock lever in the "UNLOCKED" position (lever points outboard).
R (3)Install the upper flex shaft (8) into the synchronous shaft lock bore. Seat the inner rod portion of the flex shaft flush against the bottom of the synchronous shaft lock bore. Push the metal sheathing of the flex shaft down, over the inner rod. Attach the cover plate of the flex shaft to the synchronous shaft lock with a bolt (6) and a washer (7), two places. TORQUE the bolts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
R (4)Install the opposite end of the upper flex shaft (8) into the master actuator bore and attach the flex shaft cover plate to the master actuator with a bolt (6) and a washer (7), two places. TORQUE the bolts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
R (5)(Pre SB PW4NAC 78-120) Secure the synchronous lock assembly (12) to the torque box support assembly with a bolt (9), washer (11) and nut (10) four places. Install the bolts (15), washers (11), and nuts (10) to attach the synchronous lock assembly to the torque box support assembly. Loosely tighten bolts at this point.
R (6)(Post SB PW4NAC 78-120) Secure the left synchronous lock assembly (12) to the torque box support assembly with bolt (16), washers (11) and nut (10) four places. Secure the right synchronous lock assembly (12) to the torque box support assembly with bolt (9), washers (11) and nut (10), four places. Install the bolts (15), washers (11), and nuts (10) to attach the synchronous lock assembly to the torque box support assembly. Loosely tighten bolts at this point.
R (7)Install the lower flex shaft (3) into the synchronous lock bore. Attach the flex shaft attach flange to the bottom of the synchronous shaft lock with a bolt (4), washers (5) and bolts (9), washers (11) and nuts (10), two places. Do not torque the bolts at this time.
R (8)Install the opposite end of the lower flex shaft (3) into the lower slave actuator bore and attach the attach flange with a bolt (6) and washer (7), two places. TORQUE the bolts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
R NOTE : To help install the flex shaft, the synchronous shaft lock assembly can be adjusted or loosened by loosening the attach bolts (9) on the support bracket.
R (9)After both flex shafts are installed, TORQUE the four previously installed attach flange bolts (4) to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN). Then TORQUE the bolts (9), (15), and (16) to between 50 and 70 lbf.in. (0.57 and 0.79 m.daN).
R (10)(Pre SB PW4NAC 78-120) Attach the lower flex shaft to the clamp support bracket using a P-clamp (1), two washers (14) and a bolt (2). TORQUE the bolt to between 23 and 27 lbf.in. (0.26 and 0.31 m.daN).
R (11)(Post SB PW4NAC 78-120) Attach the lower flex shaft to the clamp support bracket using a P-clamp (1), bolt (2), two washers (14) and nut (10). TORQUE the bolt to between 23 and 27 lbf.in. (0.26 and 0.31 m.daN).
R (12)Install Material No.P05-332 to the flex shaft cover plates, four places.
R (13)Connect the DH16 (DH17) electrical connector (13) to the receptacle on the synchronous shaft lock assembly. Hand tighten one-eighth turn.
NOTE : Make certain that harness does a drip loop at DH16 (DH17)

connection.(Ref. Fig. 404, 405)

D. Close-Up
(1)Adjust Thrust Reverser Actuation System (Ref. 78-31-00, P. Block 501).
(2)Perform an operational test (Ref. 78-32-11, P. Block 501).
(3)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(4)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



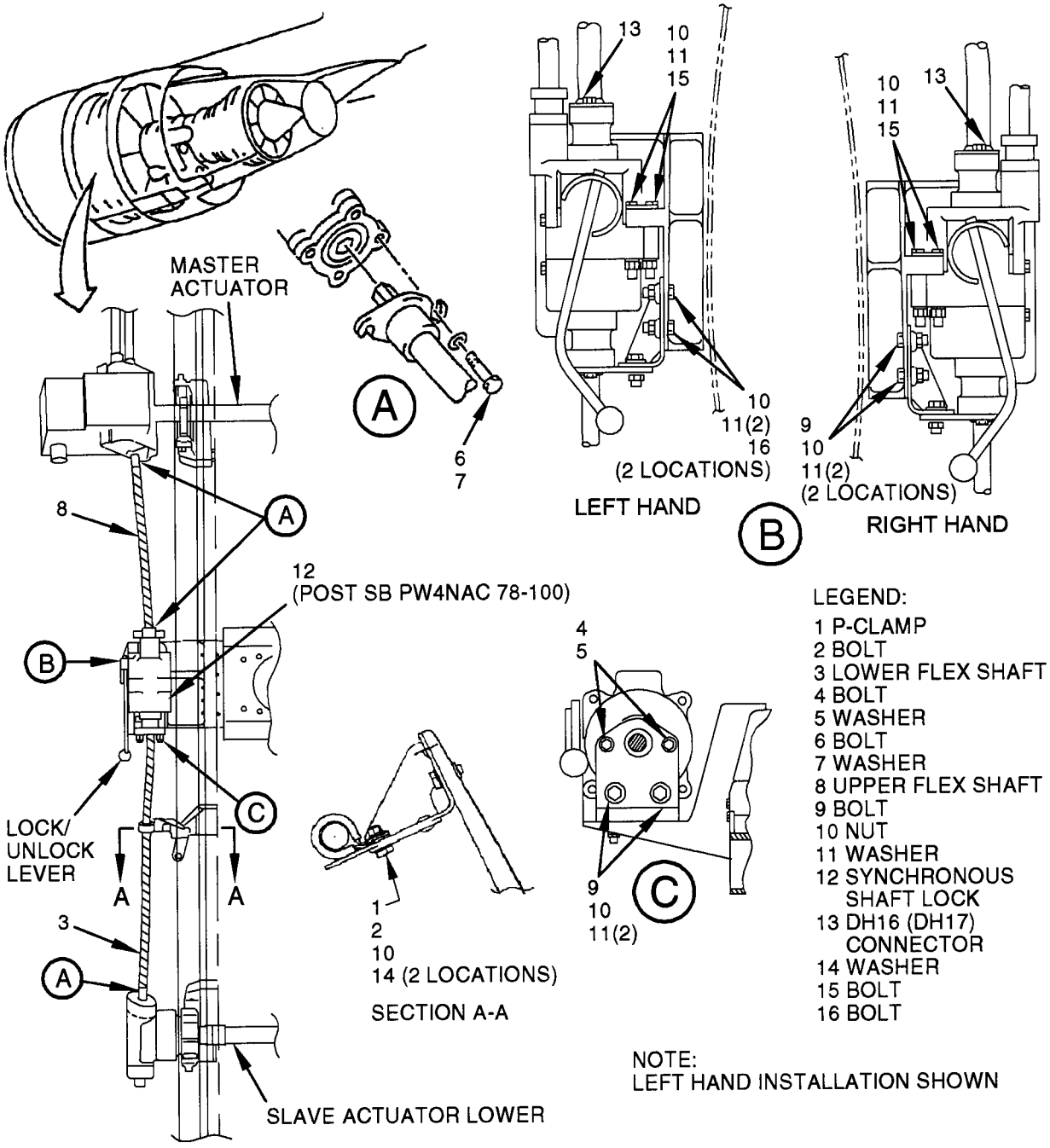
LEGEND:
1 P-CLAMP
2 BOLT
3 LOWER FLEX SHAFT
4 BOLT
5 WASHER
6 BOLT
7 WASHER
8 UPPER FLEX SHAFT
9 BOLT
10 NUT
11 WASHER
12 SYNCHRONOUS SHAFT LOCK
13 DH16 (DH17) CONNECTOR
14 WASHER
15 BOLT

NOTE:
LEFT HAND INSTALLATION SHOWN
RIGHT HAND OPPOSITE, EXCEPT
FOR LOCK/UNLOCK LEVER

L-A051T (0108)
PW C

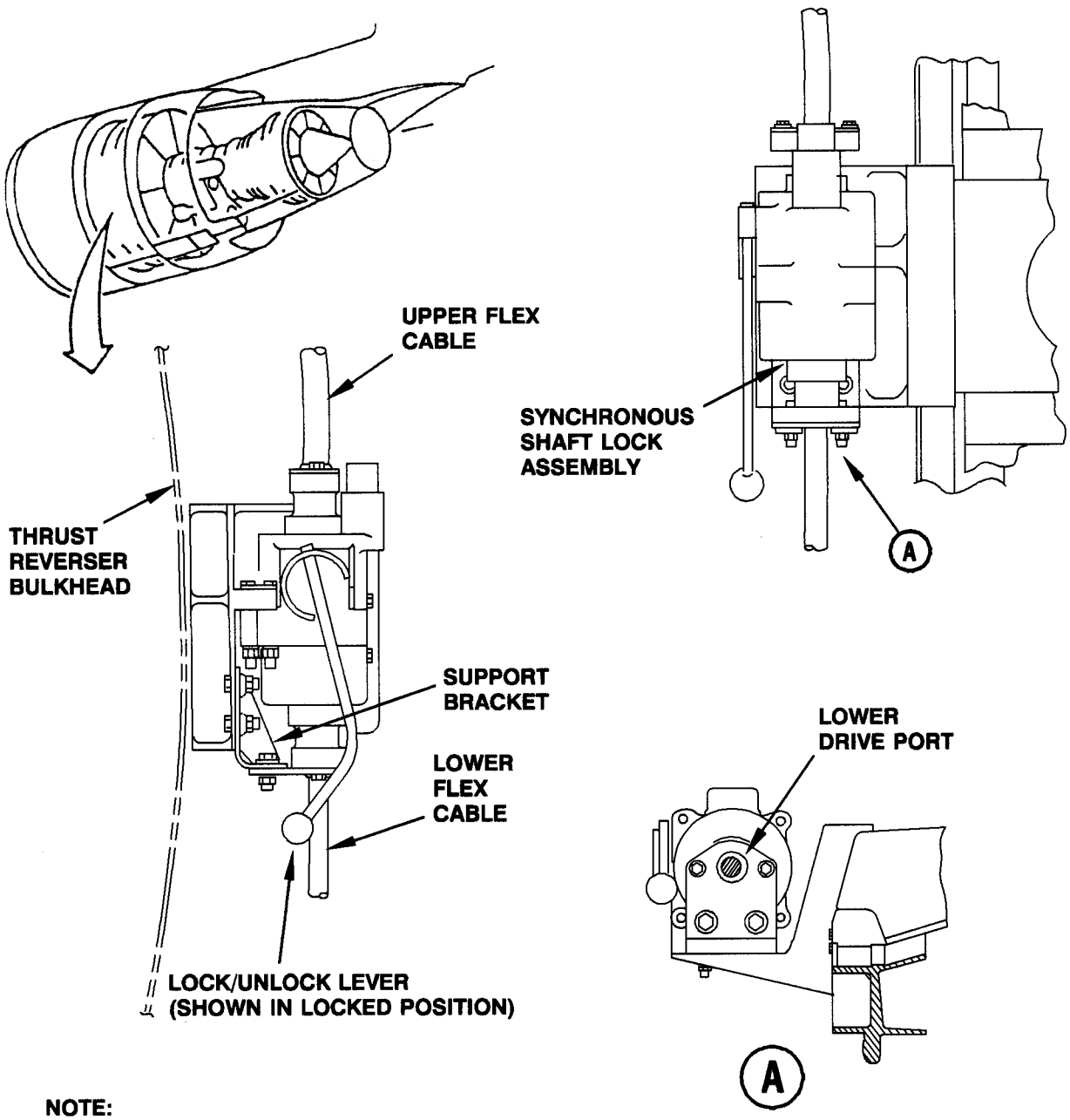
Thrust Reverser Synchronous Shaft Lock Assembly and Flex Shafts (Post SB PW4NAC 78-100, Pre SB PW4NAC 78-120)
Figure 401

R



Thrust Reverser Synchronous Shaft Lock Assembly and Flex Shafts (Post SB PW4NAC 78-100, Post SB PW4NAC 78-120)
Figure 402

R



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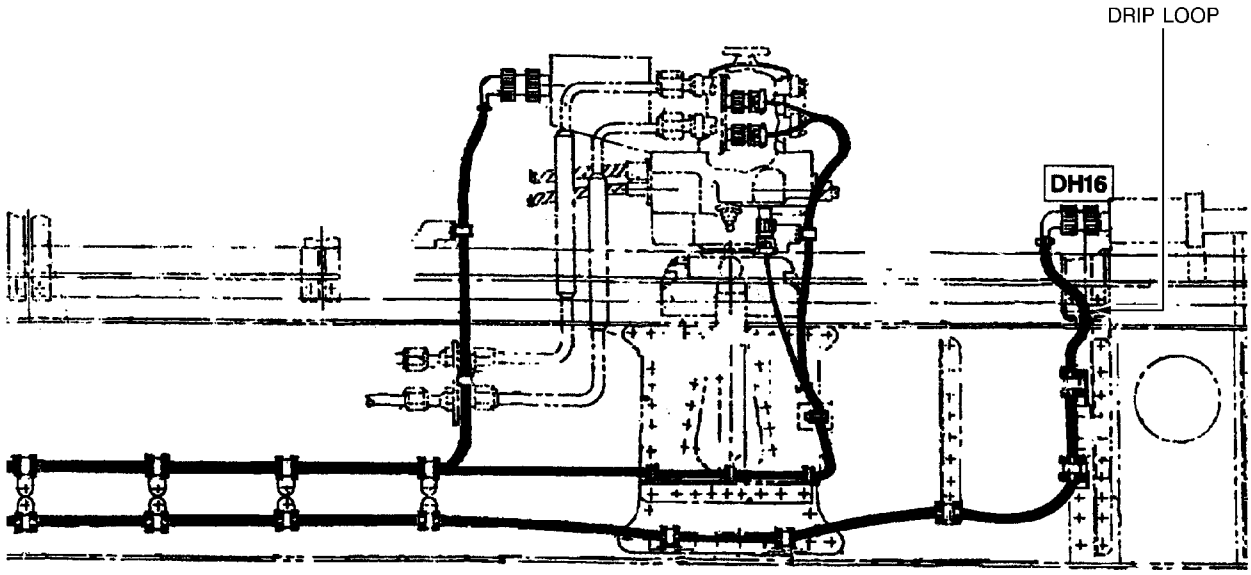
Thrust Reverser Synchronous Shaft Lock Assembly and Flex Shaft (Post SB PW4NAC 78-100)
Figure 403

R



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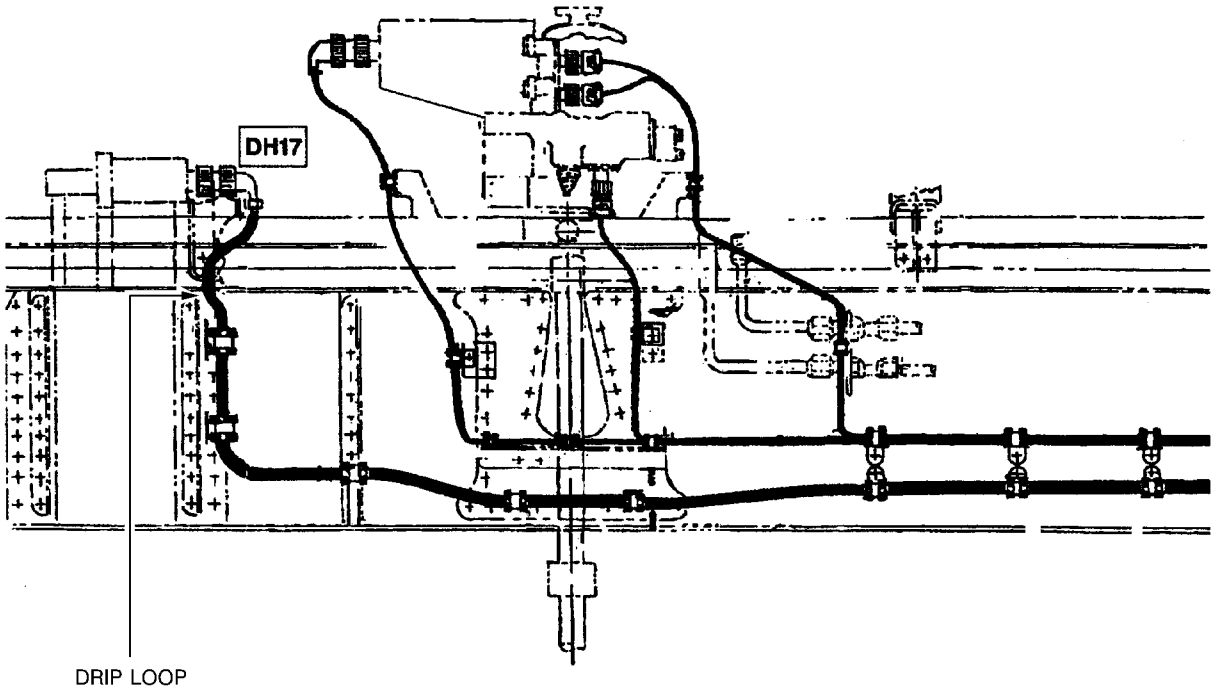
DH16 Connection
Figure 404



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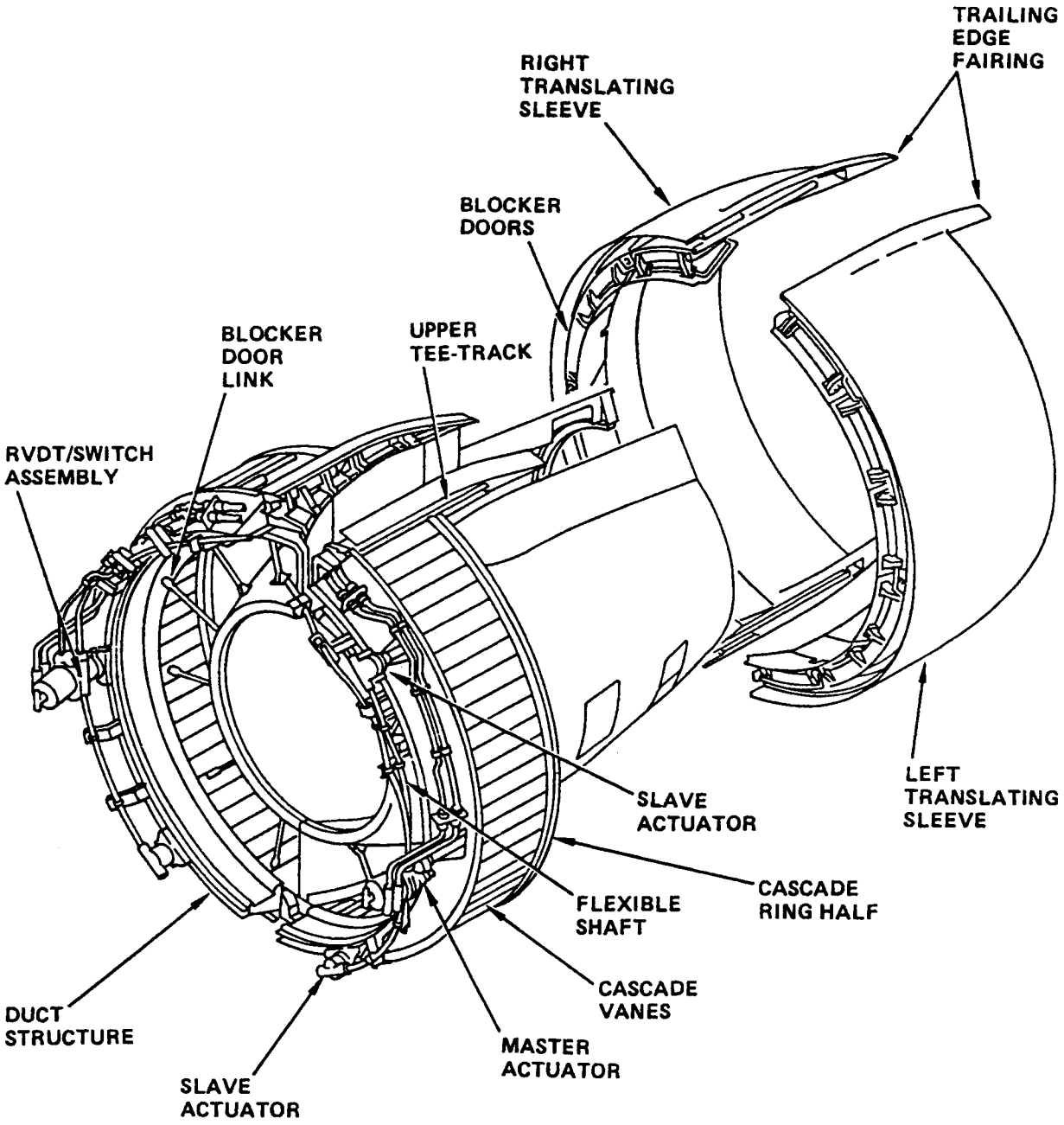
DH17 Connection
Figure 405

R THRUST REVERSER ASSEMBLY - DESCRIPTION AND OPERATION

1. General (Ref. Fig. 001)
The thrust reversing system primarily consists of the translating sleeves, cascades, exit ramp, ball screw actuators and blocker doors (Ref. Fig. 001). Each reverser half has 6 blocker doors located in the translating sleeve, each attached with a link to the stationary core cowl. The pneumatic drive unit (PDU), the pressure regulating and shutoff valve, the splitter gearbox, the selector valve and air supply plumbing are all engine mounted.
The bifurcations form the structural tie between the inner and outer duct halves and provide space for the engine mounts, controls, plumbing and EBU components. The lower bifurcation forms the passage for overboard ventilation of the core compartment.

2. Component Location
(Ref. Fig. 001)

FIN	FUNCTIONAL DESIGNATION	PANEL	ZONE	ACCESS DOOR	ATA REF.
	SLEEVE - RH TRANSLATING, ENG1 (ENG2)		452	452AR	78-32-11
			462	462AR	
	DOOR - RH BLOCKER, ENG1 (ENG2)		452	452AR	78-32-13
			462	462AR	
	LINK - RH BLOCKER DOOR, ENG1 (ENG2)		452	452AR	78-32-14
			462	462AR	
	VANE - RH CASCADE, ENG1 (ENG2)		452	452AR	78-32-12
				462AR	
	SLEEVE - LH TRANSLATING, ENG1 (ENG2)		451	451AL	78-32-11
			461	461AL	
	DOOR - LH BLOCKER, ENG1 (ENG2)		451	451AL	78-32-13
			461	461AL	
	LINK - LH BLOCKER DOOR, ENG1 (ENG2)		451	451AL	78-32-14
			461	461AL	
	VANE - LH CASCADE, ENG1 (ENG2)		451	451AL	78-32-12
				462AR	



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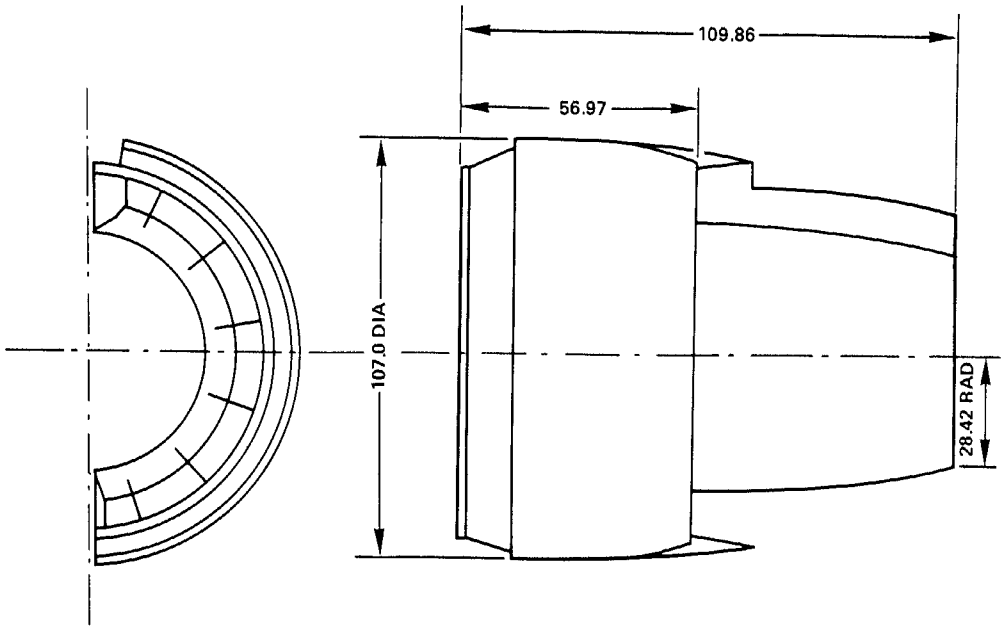
Thrust Reverser System - Component Location
Figure 001

3. Dimensions (Ref. Fig. 002)

4. Materials (Ref. Fig. 003)

5. Weight
Each reverser half weighs approximately 775 lbs.

REVERSER DIMENSIONS (IN INCHES)



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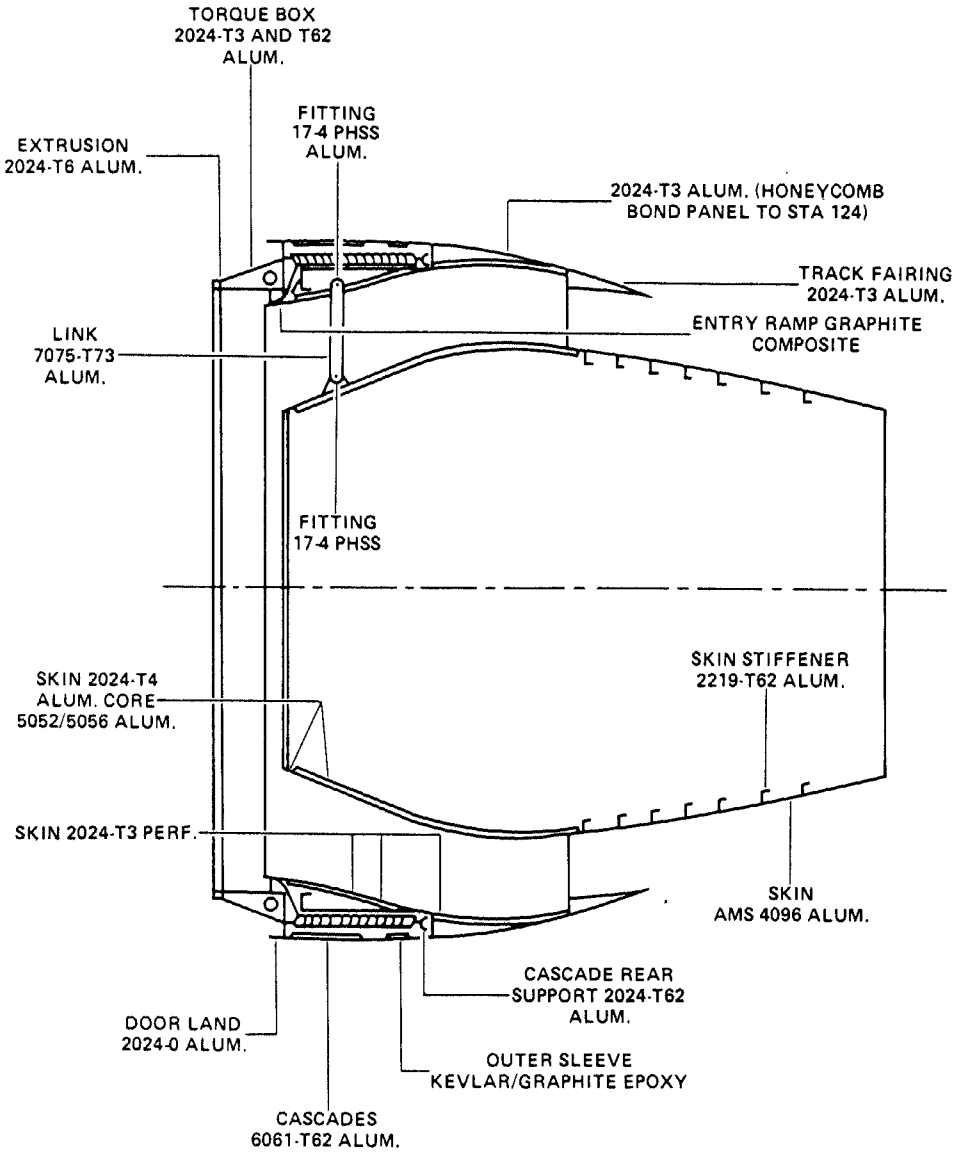
Thrust Reverser Dimensions
Figure 002



BM5 78 32 00 0 KEMO - 20

Thrust Reverser Materials
Figure 003

THRUST REVERSER ASSEMBLY - INSPECTION/CHECK

1. General

This procedure provides instructions for detailed inspection of thrust reverser tracks, inserts and sliders.

2. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves

3. Procedure

A. Job Set-Up

(1)Open safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).

(2)Deploy translating sleeves (Ref. 78-32-11, P. Block 201).

(3)Install access platform.

R B. Inspect Thrust Reverser Tracks, Inserts and Sliders (Ref. Fig. 601, 602)

CAUTION : THRUST REVERSER DOORS MUST BE CLOSED AND LATCHED BEFORE OPERATION OF ANY THRUST REVERSER SYSTEM.

NOTE : (Ref. Fig. 601) Shows the location of the sliders on a dismounted translating sleeve. Althrough the tracks and sliders are difficult to see on a mounted thrust reverser door and translating sleeve, the degree of insert wear has to be evaluated by observation of the insert at the end of track or slider.
(Ref. Fig. 602) Shows top of left translating sleeve, and where to view the top tracks and sliders (areas A, B) and shows bottom of right translating sleeve, and where to view the bottom tracks and sliders (areas C, D, E). Be sure to check both right and left translating sleeves.

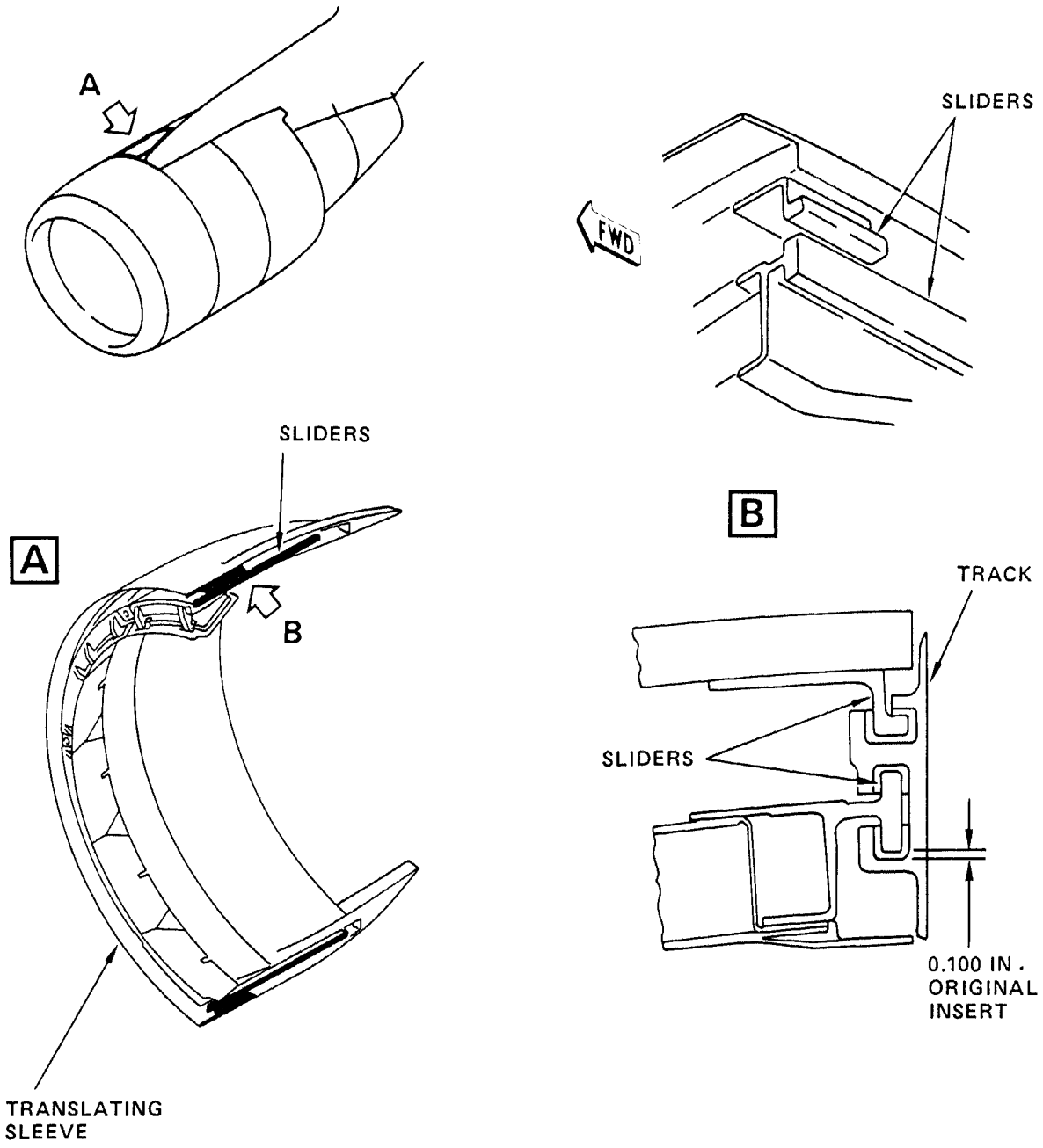
(1)Inspect ends of tracks and sliders from viewpoints shown in (Ref. Fig. 602). Ckeck face of insert for signs of wear. If any insert surface is thinner than the others, uneven wear is indicated. If any in-
R sert surface shows evidence of missing or damaged material, insert should be replaced.

(2)Inspect exposed lengths of top and bottom tracks and sliders. (Ref. Fig. 602) Look for distortion, misalignment, loose or missing in-
R sert material. Ckeck for gouges, cracks, nicks. Replace if damaged or
R missing.

C. Close-Up

(1)Remove access platform.

(2)Stow translating sleeves (Ref. 78-32-11, P. Block 201).



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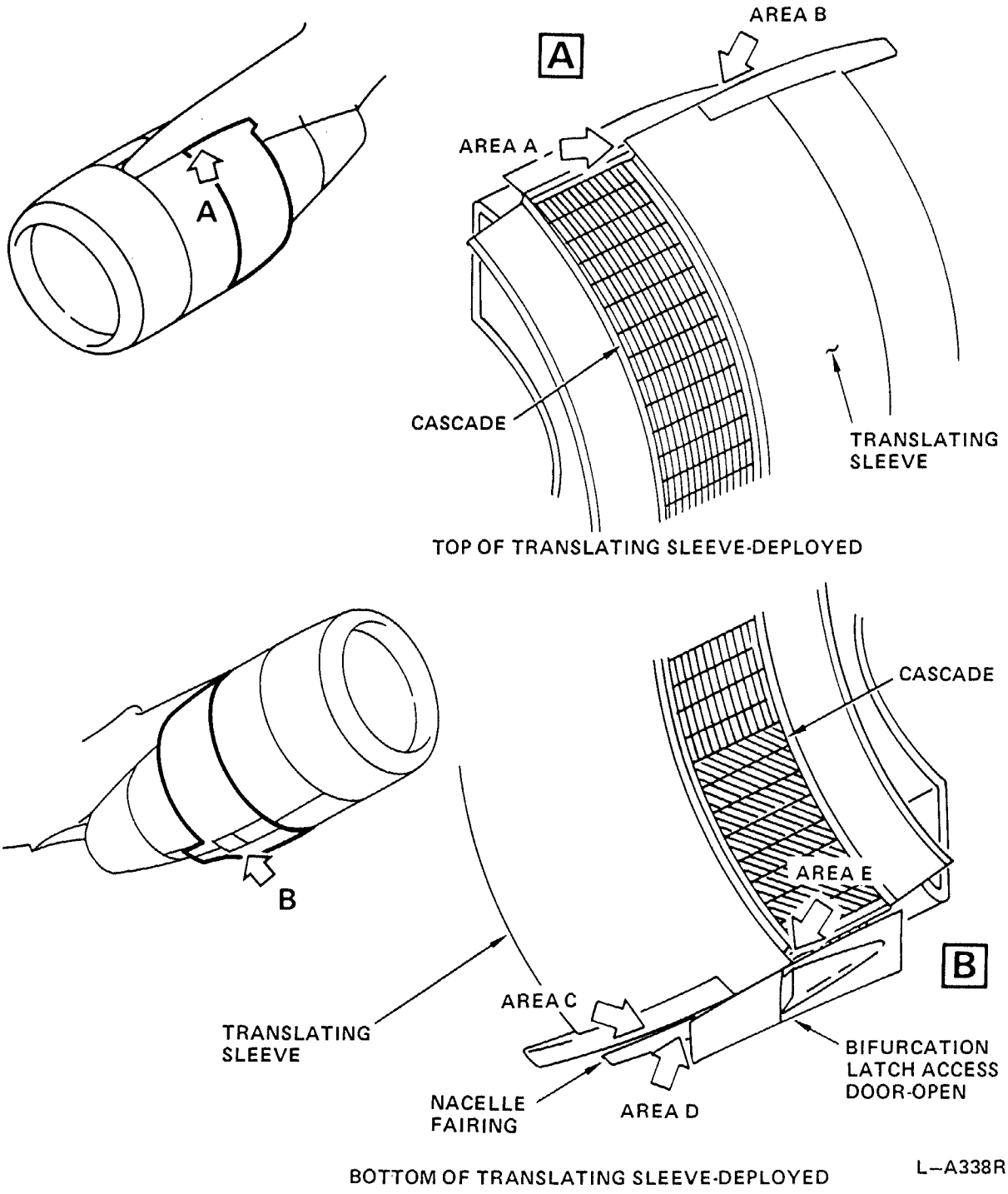
Translating Sleeve Tracks and Sliders
Figure 601



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Translating Sleeve Top and Bottom Viewpoints for Tracks and Sliders
Figure 602

(3)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

THRUST REVERSER ASSEMBLY - CLEANING/PAINTING

1. Clean The DynaRohr Wire Mesh Surface on the Thrust Reverser C-Duct, Translating Sleeve, and Blocker Doors

CAUTION : DO NOT USE THE FOLLOWING PROCEDURES TO CLEAN POLYURETHANE FILM. THE FOLLOWING PROCEDURES ARE FOR CLEANING DYNAROHR WIRE MESH ONLY.

A. General
This procedure provides cleaning instructions for the C-Duct, Translating Sleeve, and Blocker Doors with DynaRohr Wire Mesh on the cowling.

B. Equipment and Materials

ITEM	DESIGNATION
(1)Material No.P05-005	Special Materials (Ref. 70-00-00)
(2)Material No.P11-005	Cleaning Agents (Ref. 70-00-00)
(3)Material No.P11-043	Cleaning Agents (Ref. 70-00-00)

C. Procedure
WARNING : SOLVENT IS FLAMMABLE AND VAPOR IS HARMFUL. USE IN A WELL-VENTILATED AREA. AVOID PROLONGED BREATHING OF VAPOR OR PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE IRRITATION OF EYES, NOSE, THROAT, AND SKIN. HIGH CONCENTRATIONS MAY CAUSE IMPAIRED JUDGMENT. PROTECTIVE GLOVES SHOULD BE WORN DURING USE. MAY CAUSE DERMATITIS BY REMOVING SKIN OILS. PRIOR TO USE OF THESE PRODUCTS, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(1)Dampen a Clean Cotton Cloth (Material No.P05-005) with Solvents (Material No.P11-005/Material No.P11-043) (61/39 blend) solution. Do not saturate the cloth with the solution.
CAUTION : DO NOT RUB THE CLOTH BACK AND FORTH ACROSS THE SURFACE AS SOILS WILL BE EMBEDDED IN THE WIRE MESH.

(2)Wipe the contaminated area with the dampened cloth. Immediately wipe with dry cotton cloth after each solvent wipe. Replace the cloth as necessary.
CAUTION : DO NOT DAMAGE THE WIRE MESH WITH A PLASTIC SQUEEGEE.

(a)Spray the contaminated area with Solvents (Material No.P11-005/ Material No.P11-043) solution. Allow solution to soak for 15 minutes. Remove larger areas of buildup with a plastic spatula. Repeat Solvents (Material No.P11-005/Material No.P11-043) spray process and wipe area clean with a soft bristle brush.

(b)Flush the area clean with Solvents (Material No.P11-005/Material No.P11-043) solution. Air blow the surface at a 45 degree angle to dry and remove particles trapped in the wire mesh. Do not wipe the surface.

2. Clean the Polyurethane Film Surface on the Thrust Reverser Acoustic Panels and Blocker Doors

A. General
(1)This procedure provides cleaning instructions for the thrust reverser

assemblies with polyurethane film applied for repair to the inner barrel duct wall, the acoustic panels, the blocker doors and the translating sleeves.

B. Equipment and Materials

ITEM	DESIGNATION
(1)Material No.P05-005	Special Materials (Ref. 70-00-00)
(2)Material No.P11-052	Cleaning Agents (Ref. 70-00-00)

C. Procedure

CAUTION : INCORRECT METHODS OF CLEANING WILL CAUSE POLYURETHANE FILM TO DISBOND. CLEANING OF POLYURETHANE FILM SURFACES REQUIRES SPECIAL CLEANING SOLUTIONS AND PROCEDURES. DO NOT USE MEK, MIBK OR ANY SIMILAR SOLVENTS OR DEGREASERS. DO NOT AIR CLEAN USING PRESSURIZED AIR OR VACUUMS. DO NOT USE HOT WATER OR HIGH PRESSURE WASH METHODS. TEMPERATURE NOT TO EXCEED 100°F (44°C).

(1)If necessary, clean the surface area of the polyurethane film using water based cleaners only.

(a)Spray apply the cleaning solution or apply with a soft dampened cloth (Material No.P05-005). Allow solution to soak for three to five minutes.

(b)Gently rub the entire surface with a soft cloth (Material No.P05-005).

(c)Rinse clean with a water-soaked cloth until all the cleaning solution is removed.

D. Alternate Procedure

WARNING : FOLLOW ALL SAFETY GUIDELINES. AVOID CONTACT WITH SKIN. AVOID BREATHING VAPORS. USE ONLY IN A WELL VENTILATED AREA. PRIOR TO USE OF THIS PRODUCT CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(1)If necessary, clean the surface area of the polyurethane film using cleaner (Material No.P11-052).

(a)Mix one part cleaner (Material No.P11-052) with four parts water. Stir the cleaning solution until fully mixed.

(b)Spray apply the cleaning solution or apply the cleaning solution with a soft dampened cloth (Material No.P05-005). Allow solution to soak for three to five minutes.

(c)Gently rub the entire surface with a soft cloth (Material No.P05-005).

(d)Rinse clean with a water soaked cloth until all the cleaning solution is removed.

THRUST REVERSER ASSEMBLY - DEACTIVATION/REACTIVATION

1. Thrust Reverser Blocker Doors
Ref. : MMEL Sect. 1-78, Item 4 (Thrust Reversers Blocker Doors)

A. Deactivation
(1)Reason for the job
Failure of one or two blocker doors.
(2)Equipment and Materials

ITEM	DESIGNATION
(1)	Circuit Breaker Safety Clips
(2)	Access Platform
(3)	Blind Rivets NAS1738M-4
(4)	Plates, CRES321 (1.10 x 2 x 0.05 in.) (27.9 x 50.8 x 1.27 mm)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-14, P. Block 401	Blocker Door Link Assembly

(3)Procedure
(a)Job set-up
1 Open safety and tag circuit breakers for the appropriate engine and open fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
2 Partially translate thrust reverser sleeves to deploy (extend) position (Ref. 78-32-11, P. Block 201).
3 Install access platform.
(b)Deactivation (Ref. Fig. 901)
1 Remove bolts and bushing attaching link to bracket on inner barrel of thrust reverser door. (Ref. 78-32-14, P. Block 401).
2 Remove bolt, nut washers and bushings attaching link to blocker door and remove link. (Ref. 78-32-14, P. Block 401).
3 Remove three MS20426AD-4 rivets, two places in duct.
4 Retain blocker door with two plates (5) using six NAS1738M-4 blind rivets (10).
5 Manually close thrust reverser sleeves to stowed (retracted) position.
(c)Test (Ref. 78-32-11, P. Block 201)
1 Manually move thrust reverser sleeves from stow position to deploy position and from deploy position to stow position.
2 Check there is no binding while thrust reverser sleeves are displaced.
(d)Close-up
1 Remove access platform.
2 Close thrust reverser and fan cowl doors (Ref. 71-13-00, P. Block 301) and remove safety clips and tags and close circuit breakers.

B. Reactivation
(1)Equipment and Materials

ITEM	DESIGNATION
(1)	Flush head rivets MS20426AD-4
Referenced Procedures	
- 78-32-14, P. Block 401	Blocker Door Link Assembly
- 71-13-00, P. Block 301	Cowl doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves

(2)Procedure

(a)Job set-up

1 Open, safety and tag circuit breakers for the appropriate engine and fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).

2 Install access platform.

3 Partially translate thrust reverser sleeves to deploy position.

(b)Reactivation (Ref. Fig. 901)

1 Remove NAS1738M-4 blind rivets (10) and plates (5).

2 Install six MS20426AD-4 flush head rivets (3 holes, 2 places) in translating sleeve.

3 Install blocker door link (Ref. 78-32-14, P. Block 401).

4 Manually close thrust reverser sleeves to stowed (retracted) position.

(c)Test (Ref. 78-32-11, P. Block 201)

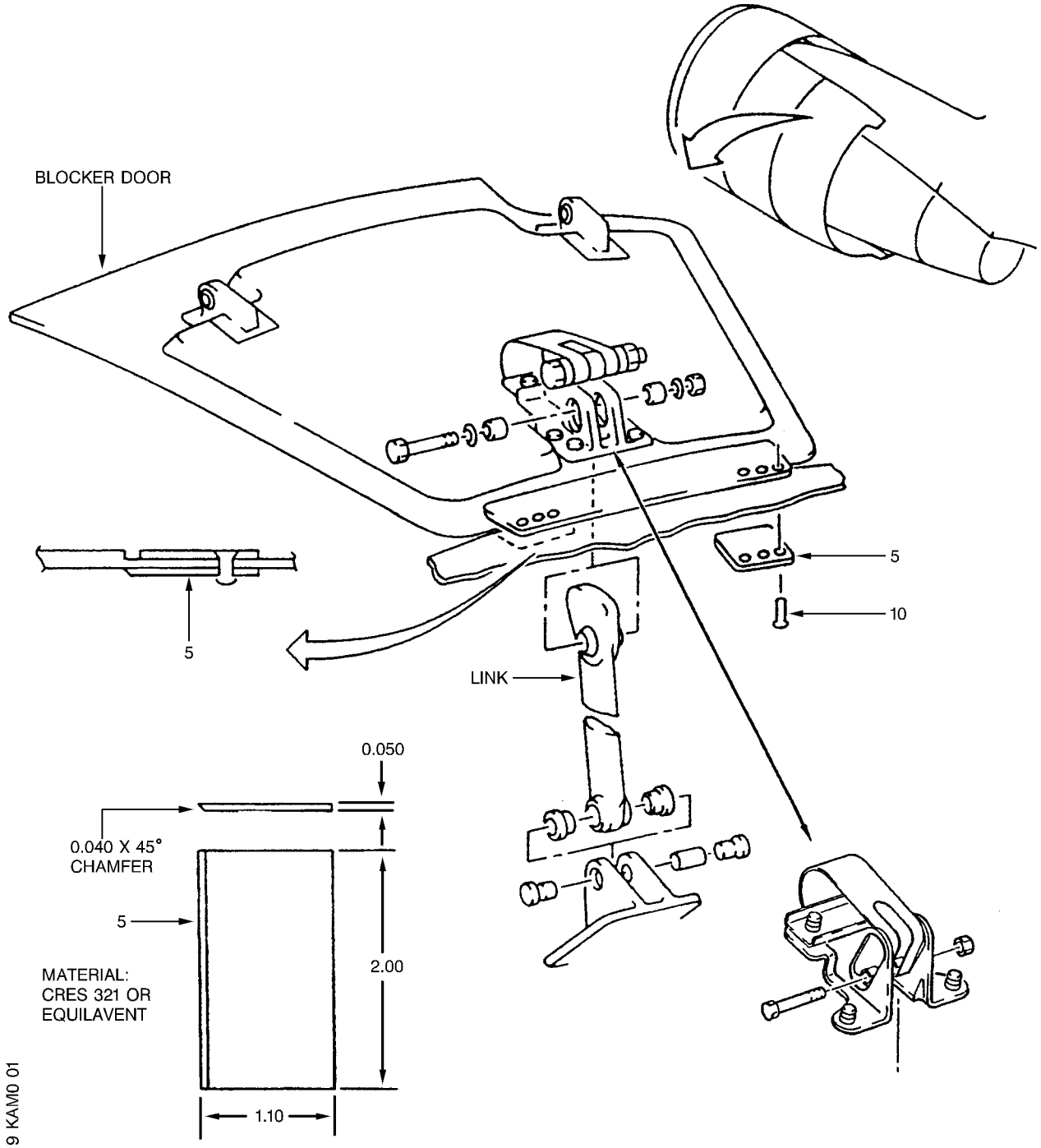
1 Manually translate thrust reverser sleeves from stow position to deploy position and from deploy position to stow position.

2 Check there is no binding while thrust reverser sleeves are displaced.

(d)Close-up

1 Remove access platform.

2 Close thrust reverser and fan cowl doors (Ref. 71-13-00, P. Block 301) and remove safety clips and tags and close circuit breakers.



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R Thrust Reverser Blocker Door Deactivation
Figure 901

2. Thrust Reverser Track Fairing
Ref. : ICDL Sect. 1-78, Item 1 (Thrust Reverser Track Fairing)

A. Deactivation
(1)Reason for the job
Missing of one or two side by side (upper or lower) aft track fairings (beaver tails).
(2)Equipment and materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves

(3)Job set-up
(a)Open, safety and tag circuit breakers for the appropriate engine and open fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(b)Partially translate thrust reverser sleeves to deploy (extend) position (Ref. 78-32-11, P. Block 201).
(c)Install access platform.
(4)Deactivation (Ref. Fig. 902)
(a)Drill out 16 rivets (8 each side) at the forward edge overlap of aft track fairing (beaver tail).
(b)Remove 6 screws attaching aft track fairing (beaver tail) to bulb seal retainer.
(c)Remove damaged aft track fairing(s).
(d)Cut the bulb seal and bulb seal retainer flush with the aft edge of the outer fairing.
(5)Close-up
(a)Remove access platform.
(b)Close thrust reverser and fan cowl doors (Ref. 71-13-00, P. Block 301) and remove safety clips and tags and close circuit breakers.

B. Reactivation
NOTE : Installation of replacement aft track fairing requires removal of thrust reverser sleeve. This procedure is a shop repair.

3. Thrust Reverser Blocker Doors
Ref. : ICDL Sect. 1-78, Item 2 (Blocker Door)

A. Deactivation
(1)Reason for the job
One blocker door is missing.
(2)Equipment and materials

ITEM	DESIGNATION
(a)	Wrench - Hex Drive Male 0.375 in.
(b)	Access Platform

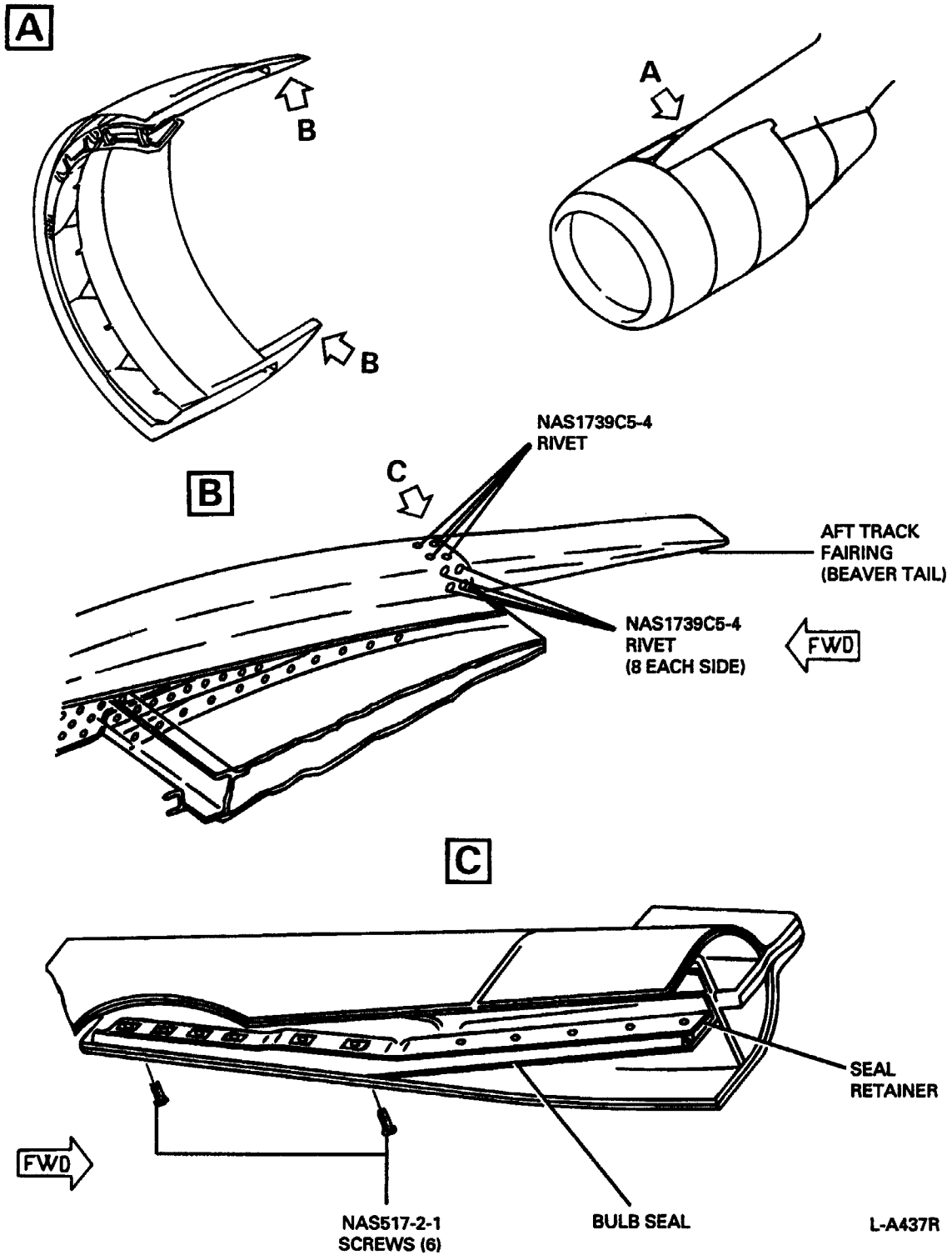
ITEM	DESIGNATION
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves
- 78-32-14, P. Block 401	Blocker Door Link Assembly

(3)Job set-up
(a)Open safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(b)Make certain that ground air duct is not connected to ground operation air transfer pneumatic valve.
(c)Partially translate thrust reverser sleeves to deploy (extend) position (Ref. 78-32-11, P. Block 201).
(d)Install access platform if necessary.
(4)Remove link of the missing blocker door.
(a)Remove link from inner barrel of thrust reverser door (Ref. 78-32-14, P. Block 401).
(5)Close-up
(a)Remove the access platform if installed.
(b)Manually move thrust reverser sleeve to full deploy position and from full deploy to full stow position (Ref. 78-32-11, P. Block 201) and check there is no binding while thrust reverser sleeves are displaced.
(c)Close fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.
(d)Perform operational test of thrust reverser translating sleeves (Ref. 78-32-11, P. Block 501).

B. Reactivation
(1)Equipment and materials

ITEM	DESIGNATION
(a)	Wrench - Hex Drive Male 0.375 in.
(b)	Access Platform
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves
- 78-32-13, P. Block 401	Thrust Reverser Blocker Doors
- 78-32-13, P. Block 601	Thrust Reverser Blocker Doors

(3)Job set-up
(a)Open safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(b)Make certain that ground air duct is not connected to ground operation air transfer pneumatic valve.
(c)Partially translate thrust reverser sleeves to deploy (extend) position (Ref. 78-32-11, P. Block 201).



Aft Track Fairing Deactivation
Figure 902

(d)Install access platform if necessary.

(4)Procedure

(a)Check the adjacent blocker doors to missing door for distortion and/or damage due to turbulence induced by cavity (Ref. 78-32-13, P. Block 601).

(b)If necessary, replace the adjacent blocker doors (Ref. 78-32-13, P. Block 401).

(c)Install the missing blocker door and link assembly (Ref. 78-32-13, P. Block 401).

(d)Manually translate thrust reverser sleeves from stow position to deploy position and from deploy position to stow position (Ref. 78-32-11, P. Block 201).

(e)Check there is no binding while thrust reverser sleeves are translated.

(5)Close-up

(a)Remove the access platform if installed.

(b)Close fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.

(c)Perform operational test of thrust reverser translating sleeves (Ref. 78-32-11, P. Block 501).

4. Thrust Reverser Blocker Doors

Ref. : ICDL Sect. 1-78, Item 3 (Blocker Door Link)

A. Deactivation

(1)Reason for the job

One blocker door link is missing.

(2)Equipment and materials

ITEM	DESIGNATION
(a)	Wrench - Hex Drive Male 0.375 in.
(b)	Access Platform
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves
- 78-32-13, P. Block 401	Thrust Reverser Blocker Doors

(3)Job set-up

(a)Open safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).

(b)Make certain that ground air duct is not connected to ground operation air transfer pneumatic valve.

(c)Partially translate thrust reverser sleeves to deploy (extend) position (Ref. 78-32-11, P. Block 201).

(d)Install access platform if necessary.

(4)Remove the affected blocker door.

(a)Remove the blocker door from the translating sleeve (Ref. 78-32-13, P. Block 401).

(5)Close-up

(a)Remove the access platform if installed.
(b)Manually move thrust reverser sleeve to full deploy position and from full deploy to full stow position (Ref. 78-32-11, P. Block 201) and check there is no binding while thrust reverser sleeves are displaced.
(c)Close fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.
(d)Perform operational test of thrust reverser translating sleeves (Ref. 78-32-11, P. Block 501).

B. Reactivation
(1)Equipment and materials

ITEM	DESIGNATION
(a)	Wrench - Hex Drive Male 0.375 in.
(b)	Access Platform
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves
- 78-32-13, P. Block 401	Thrust Reverser Blocker Doors
- 78-32-13, P. Block 601	Thrust Reverser Blocker Doors

(3)Job set-up
(a)Open safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(b)Make certain that ground air duct is not connected to ground operation air transfer pneumatic valve.
(c)Partially translate thrust reverser sleeves to deploy (extend) position (Ref. 78-32-11, P. Block 201).
(d)Install access platform if necessary.
(4)Procedure
(a)Check the adjacent blocker doors to missing door for distortion and/or damage due to turbulence induced by cavity (Ref. 78-32-13, P. Block 601).
(b)If necessary, replace the adjacent blocker doors (Ref. 78-32-13, P. Block 401).
(c)Install the missing blocker door and link assembly (Ref. 78-32-13, P. Block 401).
(d)Manually translate thrust reverser sleeves from stow position to deploy position and from deploy position to stow position (Ref. 78-32-11, P. Block 201).
(e)Check there is no binding while thrust reverser sleeves are translated.
(5)Close-up
(a)Remove the access platform if installed.
(b)Close fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.
(c)Perform operational test of thrust reverser translating sleeves (Ref. 78-32-11, P. Block 501).

5. Thrust Reverser Blocker Doors
Ref. : ICDL Sect. 1-78, Item 4 (Blocker Doors)

A. Deactivation
(1)Reason for the job
One blocker door is missing.
(2)Equipment and materials

ITEM	DESIGNATION
(a)	Wrench - Hex Drive Male 0.375 in.
(b)	Access Platform
(c)	Warning Notice
(d)Material No.P05-002	Special Materials (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-00, P. Block 901	Thrust Reverser System Control
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves

(3)Job set-up
(a)Open safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(b)Make certain that ground air duct is not connected to ground operation air transfer pneumatic valve.
(c)Partially translate thrust reverser sleeves to deploy (extend) position (Ref. 78-32-11, P. Block 201).
(d)Install access platform if necessary.
(4)Procedure
(a)Secure the link of the missing blocker door on inner barrel with speed tape (Material No.P05-002).
(b)Do deactivation of the thrust reverser as per failure of thrust reverser system (Ref. 78-31-00, P. Block 901).
(5)Close-up
(a)Remove the access platform if installed.
(b)Close the fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.
(c)Placard a warning notice on thrust reverser control lever in flight compartment to indicate that thrust reverser is deactivated and locked out.

B. Reactivation
(1)Equipment and materials

ITEM	DESIGNATION
(a)	Wrench - Hex Drive Male 0.375 in.
(b)	Access Platform
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-00, P. Block 901	Thrust Reverser System Control
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

ITEM	DESIGNATION
- 78-32-13, P. Block 401	Thrust Reverser Blocker Doors
- 78-32-13, P. Block 601	Thrust Reverser Blocker Doors

(2)Job set-up
(a)Open safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(b)Make certain that ground air duct is not connected to ground operation air transfer pneumatic valve.
(c)Install access platform if necessary.
(3)Procedure
(a)Do a reactivation of thrust reverser system as per reactivation after failure of thrust reverser system (Ref. 78-31-00, P. Block 901).
(b)Partially translate thrust reverser sleeves to deploy (extend) position (Ref. 78-32-11, P. Block 201).
(c)Check the adjacent blocker doors to missing door for distortion and/or damage due to turbulence induced by cavity (Ref. 78-32-13, P. Block 601).
(d)If necessary, replace the adjacent blocker doors (Ref. 78-32-13, P. Block 401).
(e)Install the missing blocker door and link assembly (Ref. 78-32-13, P. Block 401).
(f)Manually translate thrust reverser sleeves from stow position to deploy position and from deploy position to stow position (Ref. 78-32-11, P. Block 201).
(g)Check there is no binding while thrust reverser sleeves are translated.
(4)Close-up
(a)Remove the access platform if installed.
(b)Close fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.
(c)Perform operational test of thrust reverser translating sleeves (Ref. 78-32-11, P. Block 501).

**ON A/C 101-200,

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1. Manually Deploy and Stow Translating Sleeves

CAUTION : TO PREVENT BINDING, ENSURE THAT THRUST REVERSER DOORS ARE LOWERED AND LATCHED BEFORE OPERATING TRANSLATING SLEEVES.

WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE TO INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

A. Equipment and Materials

ITEM	DESIGNATION
(1)	Circuit Breaker Safety Clips
(2)	Access Platform
(3)	Wedges (Primary Brake, Secondary Lock)
(4)	Torque Wrench (0.37 in. Hex-drive Male)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-15, P. Block 201	Master and Slave Actuator

B. Job Set-Up

(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).

(2)Install access platform.

(3)Ensure that ground air duct is not connected to ground operation air transfer pneumatic valve.

C. Manually Deploy Translating Sleeves

CAUTION : DO NOT PULL THE PDU BRAKE HANDLE WHEN THE PDU IS DISCONNECTED FROM THE MASTER ACTUATORS (WHEN THE FLEXIBLE DRIVE SHAFTS HAVE BEEN DETACHED). FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN THE PDU MISALIGNMENT.

(1)Pull and retain primary brake release handle on PDU (Ref. Fig. 201, 204).

CAUTION : MAKE SURE THAT THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCKED POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER SYSTEM.

(2)Manually unlock synchronous shaft lock assembly (Ref. Fig. 205).

(3)Pull and retain secondary lock release handle on both master actuator (Ref. Fig. 202, 204).

(4)Remove two screws and plate from unused recess on master actuator and save for reuse.

(5)Insert 0.37 in. hex-drive male wrench in master actuator recessed drive and deploy translating sleeves as required.
NOTE : "Nominal deployed" means that the actuator has extended 20.84 in. (529.336 mm) from stowed position. This is 7.5 revolutions toward stow from the fully deployed position.
"Fully deployed" means that the actuator has extended against the extend (aft) stops (Ref. Fig. 203).

D. Manually Stow Translating Sleeves
(1)Pull and retain primary brake release handle on (PDU) (Ref. Fig. 201, 204).
CAUTION : MAKE SURE THAT THE SYNCHRONOUS SHAFT LOCK ASSEMBLY IS IN THE UNLOCKED POSITION BEFORE ATTEMPTING TO DEPLOY THE TRANSLATING SLEEVE. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE THRUST REVERSER SYSTEM.
(2)Manually unlock synchronous shaft lock assembly (Ref. Fig. 205).
(3)Pull and retain secondary lock release handle on both master actuator (Ref. Fig. 202, 204).
(4)Remove two screws and plate from unused recess in master actuator and save for reuse.
(5)Insert 0.37 in. hex-drive male wrench in master actuator recessed drive and drive translating sleeves to fully stowed position.
NOTE : When sleeves are fully stowed the secondary lock position indicator will be at "DELTA".
(± 1/2 width of "DELTA" mark) (Detail A) (Ref. Fig. 202)
NOTE : If the translating sleeve is not held in place to compensate for the bulb seal compression, the actuator traveling tube will not come to full stow and the REV unlock light could illuminate.
(6)Check secondary lock position. If position is correct, release secondary lock handles in master actuators, if position is incorrect, resynchronize secondary lock. (Ref. 78-31-15, P. Block 201).
(7)Remove hex-drive male wrench from recessed drive in master actuator and install recess plate with bolts.
TORQUE bolts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

**ON A/C 101-200,

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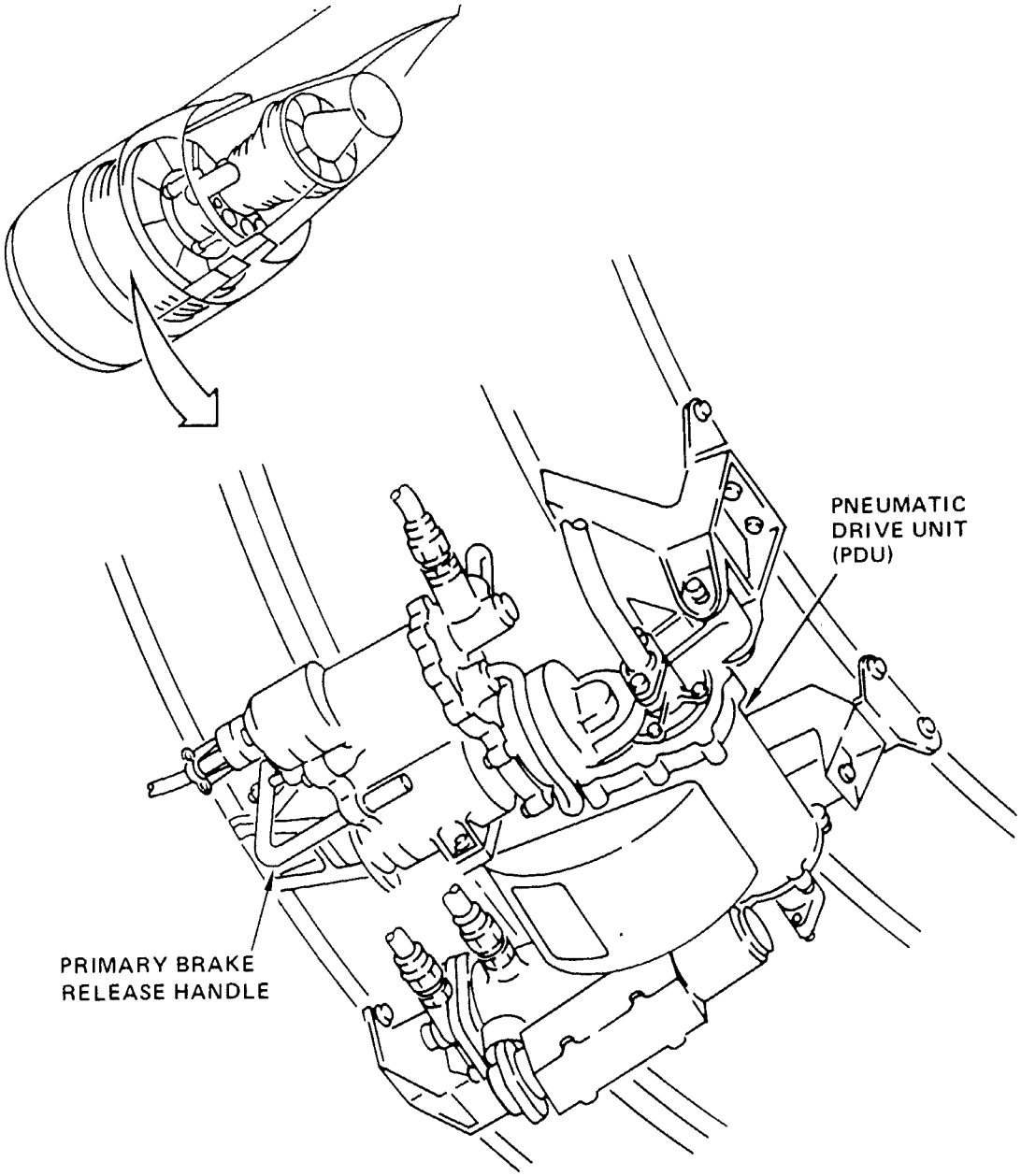
E. Close-Up
(1)Remove wedge to release primary brake release handle in PDU.
(2)Return the manual unlock lever of the synchronous shaft lock in normal position.
(3)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(4)Remove access platform.
(5)Close fan cowl doors (Ref. 71-13-00, P. Block 301).
Remove safety clips and tags and close circuit breakers.



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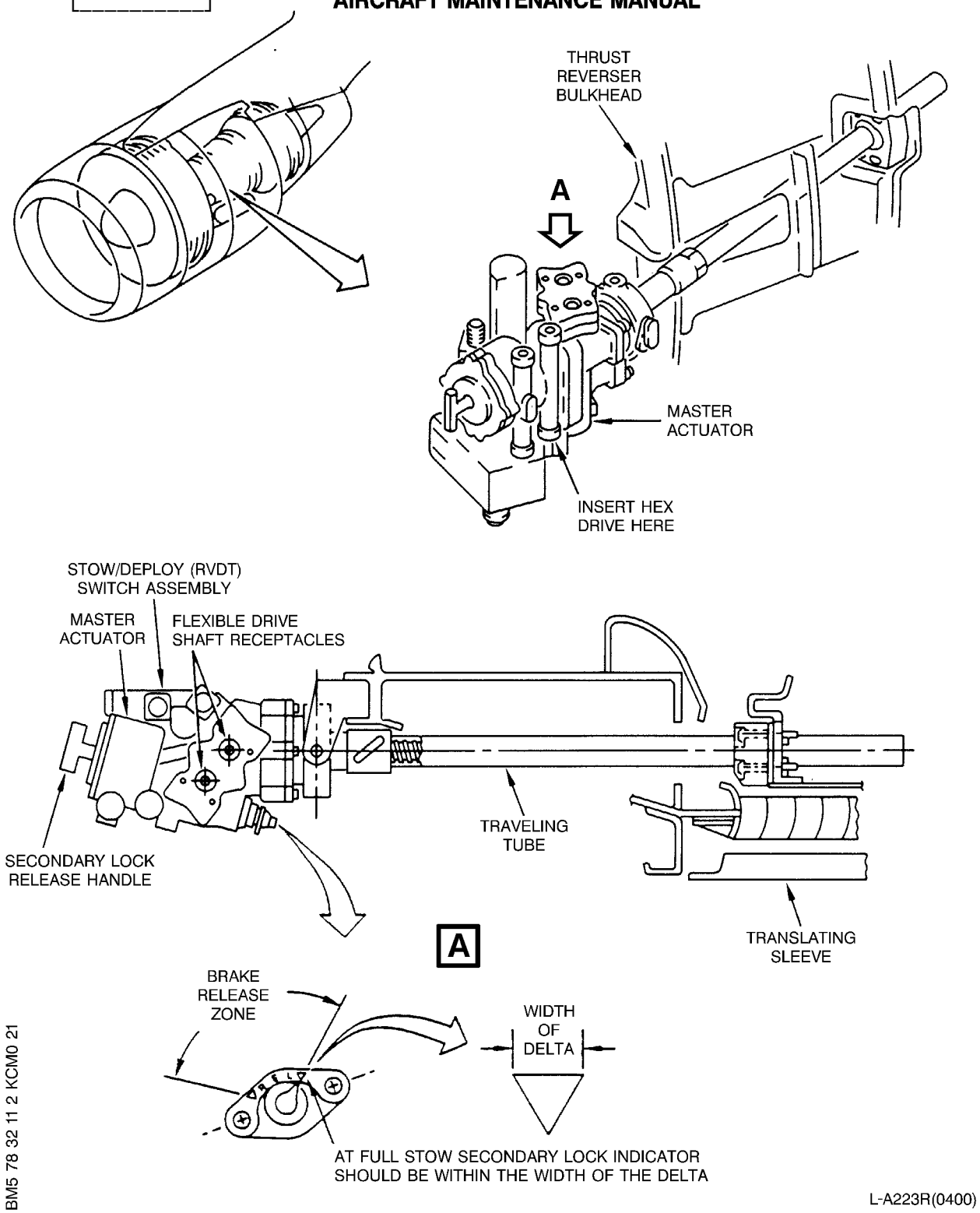
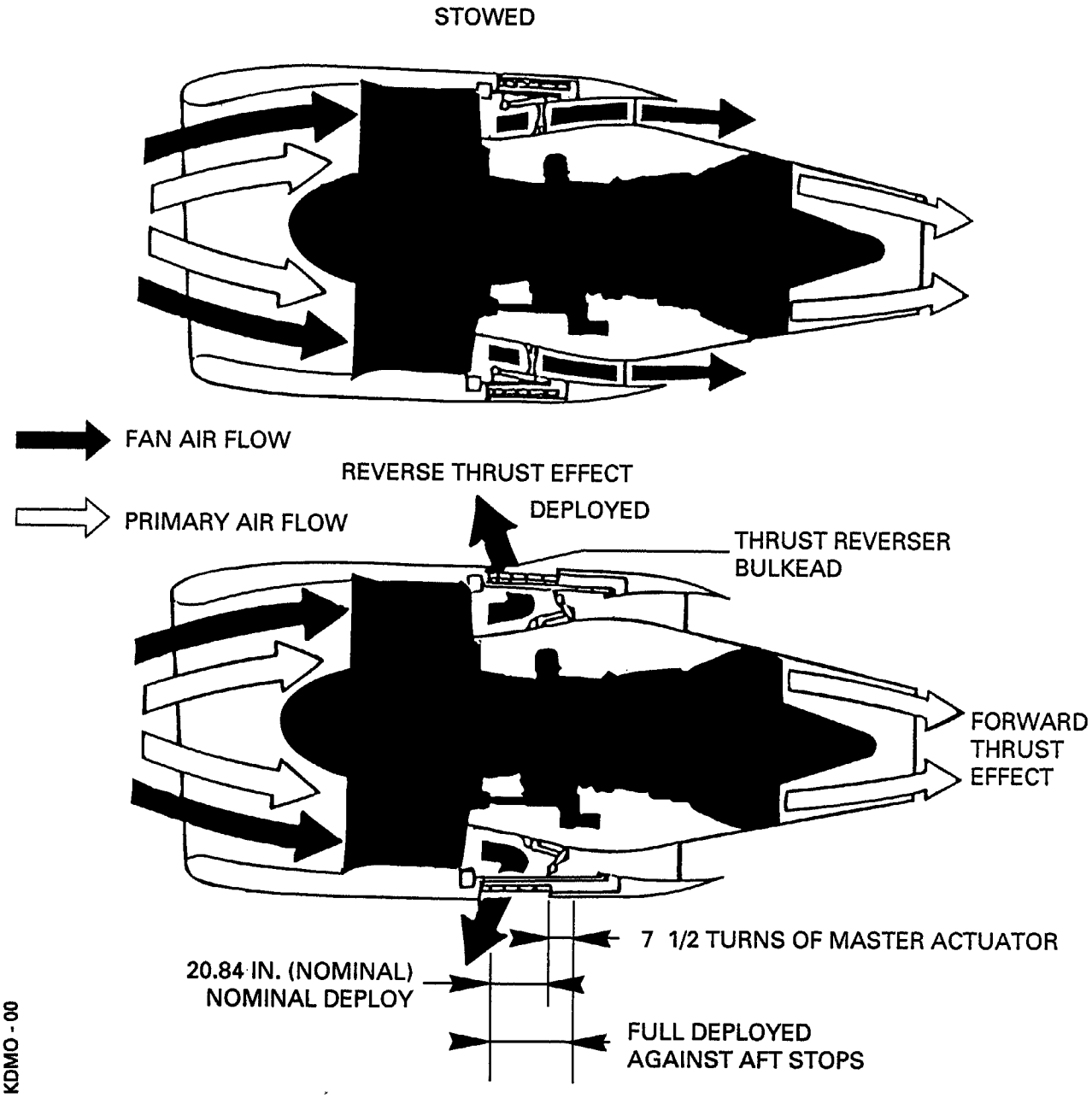
Primary Brake Release Handle on Pneumatic Drive Unit
Figure 201

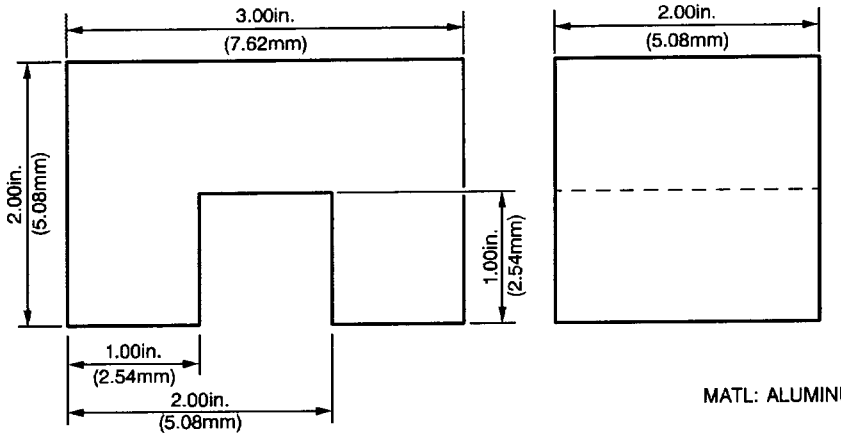


Secondary Lock Release on Master Actuator
Figure 202



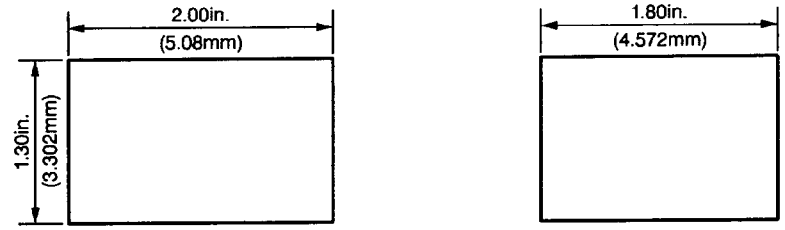
Thrust Reverser Positions
Figure 203

SECONDARY LOCK WEDGE



MATL: ALUMINUM/WOOD

PRIMARY LOCK WEDGE



MATL: ALUMINUM/WOOD

L-A056T(0400)

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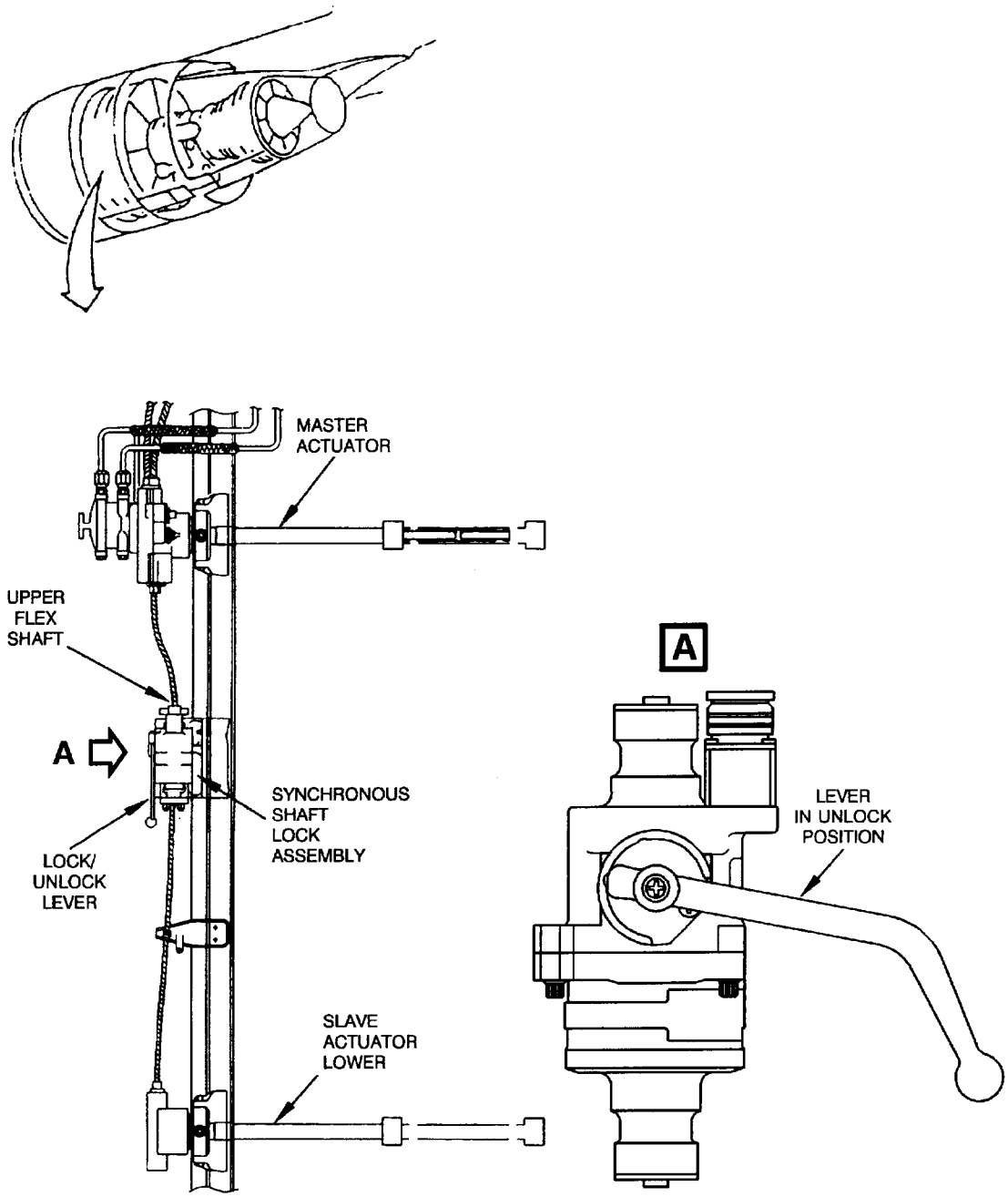
Slave Actuator Cover - Lockout Adapter
Figure 204



BM5 78 32 11 2 KJM0 00

Synchronous Shaft Lock
Figure 205

2. Pneumatically Deploy and Stow Translating Sleeves

CAUTION : TO PREVENT BINDING, ENSURE THAT THRUST REVERSER DOORS ARE LOWERED AND LATCHED BEFORE OPERATING TRANSLATING SLEEVES.

A. Equipment and Materials

ITEM	DESIGNATION
(1)	Circuit Breaker Safety Clips
(2)	Access Platform
(3)RSE1079	Ground Air Supply Hose
Referenced Procedures	
- 24-41-00, P. Block 301	AC External Power Control
- 36-00-00, P. Block 1	Pneumatic
- 49-00-00, P. Block 501	APU
- 71-13-00, P. Block 301	Cowl Doors

B. Job Set-Up

(1)Open, safety and tag the appropriate circuit breakers and open for the appropriate engine : 1KM(2KM).

(2)Make sure that the thrust reverser cowl doors are closed.

(3)Open the right fan cowl doors (Ref. 71-13-00, P. Block 301).

(4)Remove the pneumatic starter duct connection cap and install air motor ground air supply hose (Ref. Fig. 206).

(5)Pull out the lockpin on the ground operation air transfer pneumatic valve. Hold the handle in the closed position. Remove the valve port cap.

(6)Remove the ground operation air transfer pneumatic valve cap. Hold the handle in the closed position to install the Ground Air Supply hose (Ref. Fig. 206).

(7)Pressurize the aircraft.

(a)Using HP ground pneumatic source

- Connect the HP ground air supply unit to the HP ground connector

NOTE : To do this procedure and to test the ENG2 only, open the crossfeed valve as follows :

- On AIR BLEED panel, 436VU.
  . Release the X FEED mode pushbutton switch (MAN legend on)
  . Press the X FEED valve position pushbutton switch (flowbar in line).

(b)Start the APU (Ref. 49-00-00, P. Block 501).

- On AIR BLEED panel, 436VU.
- place APU BLEED switch in ON position
  . Put the APU BLEED switch to the ON position (flowbar on the APU BLEED annunciator comes on).
  . Check that the X FEED valve position pushbutton switch flowbar is in line.

CAUTION : MAKE SURE THAT THE INLET PRESSURE IS ABOVE 25 PSIG (172.4 kPa) TO FULLY ENERGIZE THE SYSTEM.

(8)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

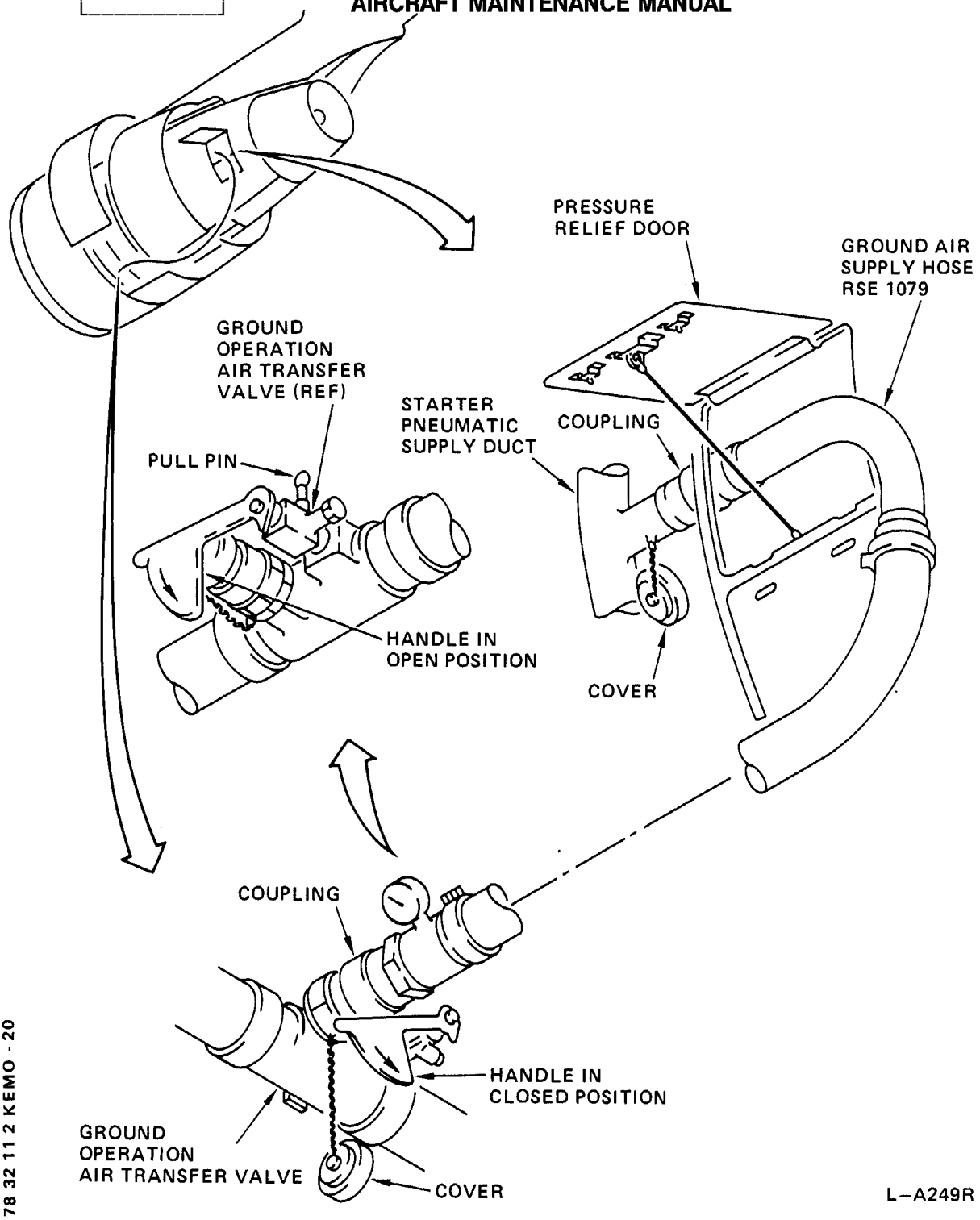
(9)Make sure that the electronics racks ventilation is correct.

(10)Remove safety, clips and tags and close circuit breakers 1KM(2KM), 3KM(4KM), 45KM(44KM).

C. Procedure
(1)At Center Control Pedestal, check that thrust reverser control lever of the untested engine is below 22°.
(2)At Center Control Pedestal, use thrust reverser control levers to cycle translating sleeves to stow, deploy, and stow positions.

**ON A/C 101-200,

D. Close-Up
(1)Open, safety and tag the following circuit breakers for the appropriate engine : 1KM(2KM).
(2)Depressurize the aircraft systems and disconnect the pneumatic ground power unit (Ref. 36-00-00, P. Block 1).
(3)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(4)Disconnect the thrust reverser air motor supply hose and cap duct outlet. On the ground operation air transfer pneumatic valve, cap the valve port. Release handle to the open position and replace the lockpin.
(5)Disconnect the pneumatic duct supply hose and cap the starter duct outlet.
(6)Make certain that the working area is clean and clear of tools and miscellaneous items of equipment.
(7)Close the right fan cowl doors. Remove safety clips and tags and close circuit breakers 1KM(2KM) (Ref. 71-13-00, P. Block 301).
(8)Make certain that throttle control levers are in idle position.



Translating Sleeves
Figure 206

THRUST REVERSER TRANSLATING SLEEVES - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
C.	Cotter Pin
D.	Torque Wrench
E. Material No.P05-127	Special Materials (Ref. 70-00-00)
F. Material No.P11-043	Cleaning Agents (Ref. 70-00-00)
G. Material No.P18-015	Primer (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-00, P. Block 601	Thrust Reverser System Control
- 78-31-15, P. Block 201	Master and Slaved Actuators
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-12, P. Block 401	Thrust Reverser Cascades
- 78-32-16, P. Block 401	Thrust Reverser Cascade Support Frame Assembly

2. Procedure

CAUTION : SOME THRUST REVERSER ACTUATION SYSTEM COMPONENTS ARE ELECTRICALLY CONNECTED TO WEIGHT ON WHEELS (WOW) SWITCHES. DO NOT OPEN THESE CIRCUIT BREAKERS.

A. Job Set-Up

(1) Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).

(2) Install access platform.

CAUTION : DO PREVENT BINDING, ENSURE THAT THRUST REVERSER DOORS ARE LOWERED AND LATCHED BEFORE OPERATING TRANSLATING SLEEVES.

WARNING : DISCONNECT THE PNEUMATIC POWER SUPPLY BEFORE PERFORMING MAINTENANCE TASKS ON THE THRUST REVERSER ACTUATION SYSTEM. A POWER SURGE COULD CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

R B. Removal (Ref. Fig. 401, 402)

(1) Manually deploy translating sleeves. (Ref. 78-32-11, P. Block 201).

(2) Remove cotter pins, nuts, bushings, washers and bolts attaching blocker
R doors to door links. Discard nuts.
R NOTE : On alternate spring link configuration, remove the nut and bolt.
R Discard the nut.

(3) Gain access to actuator traveling tube block by removing two cascades adjacent to master and both slave actuators. (Ref. 78-32-12, P. Block 401).

CAUTION : ROTATION OF TRAVELING TUBE WILL DESYNCHRONIZE AND DAMAGE THE ACTUATOR.

(4) To prevent traveling tube from freely rotating during and after removal

of translating sleeve, secure traveling tube on actuator translating shaft.

(5)At master and both slave actuators, remove four screws that secure actuator traveling tube block to translating sleeve. Retain existing shim at each actuator location.

(6)Manually move translating sleeve aft on sliders and remove sleeve from thrust reverser door tracks.

NOTE : Each translating sleeve weighs approximately 188 lbs (85 kg).

(7)Support translating sleeves off the floor on sand bags or equivalent with seal side down.

R C. Installation (Ref. Fig. 401, 402, 403)
R (Ref. Fig. 404, 405, 406)

CAUTION : MINIMAL GAP REQUIREMENTS BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND THE AFT CASCADE SUPPORT FRAME HAVE BEEN INTRODUCED BY SERVICE BULLTIN PW4NAC 78-78. REWORK PROCEDURES FOUND IN SERVICE BULLETIN PW4NAC 78-78 IS NECESSARY IF THE GAP REQUIREMENTS CANNOT BE MET WHEN YOU DO THE GAP CHECK PROCEDURE AS DEFINED IN THIS SECTION.

(1)Position shim on translating sleeve side of each actuator traveling tube block.

NOTE : Each translating sleeve weighs approximately 188 lbs (85 kg).

(2)Position translating sleeve sliders to engage thrust reverser door tracks.

(3)Move translating sleeve forward on track until forward edge of sleeve is approximately 18 in. (457.2 mm) from thrust reverser aft bulkhead.

(4)Driving through master actuator, manually deploy actuators until blocks contact translating sleeve (Ref. 78-32-11, P. Block 201).

(5)At each actuator, attach shim and traveling tube block to translating sleeve with four screws. Chamfered edge of block must be outboard. TORQUE screws to between 50 and 70 lbf.in. (0.56 and 0.79 m.daN).

(6)Check gap between thrust reverser aft frame and translating sleeve forward edge (Ref. 78-31-15, P. Block 201).

NOTE : A red WARNING band on the thrust reverser structure will be visible if the sleeves are not fully stowed.

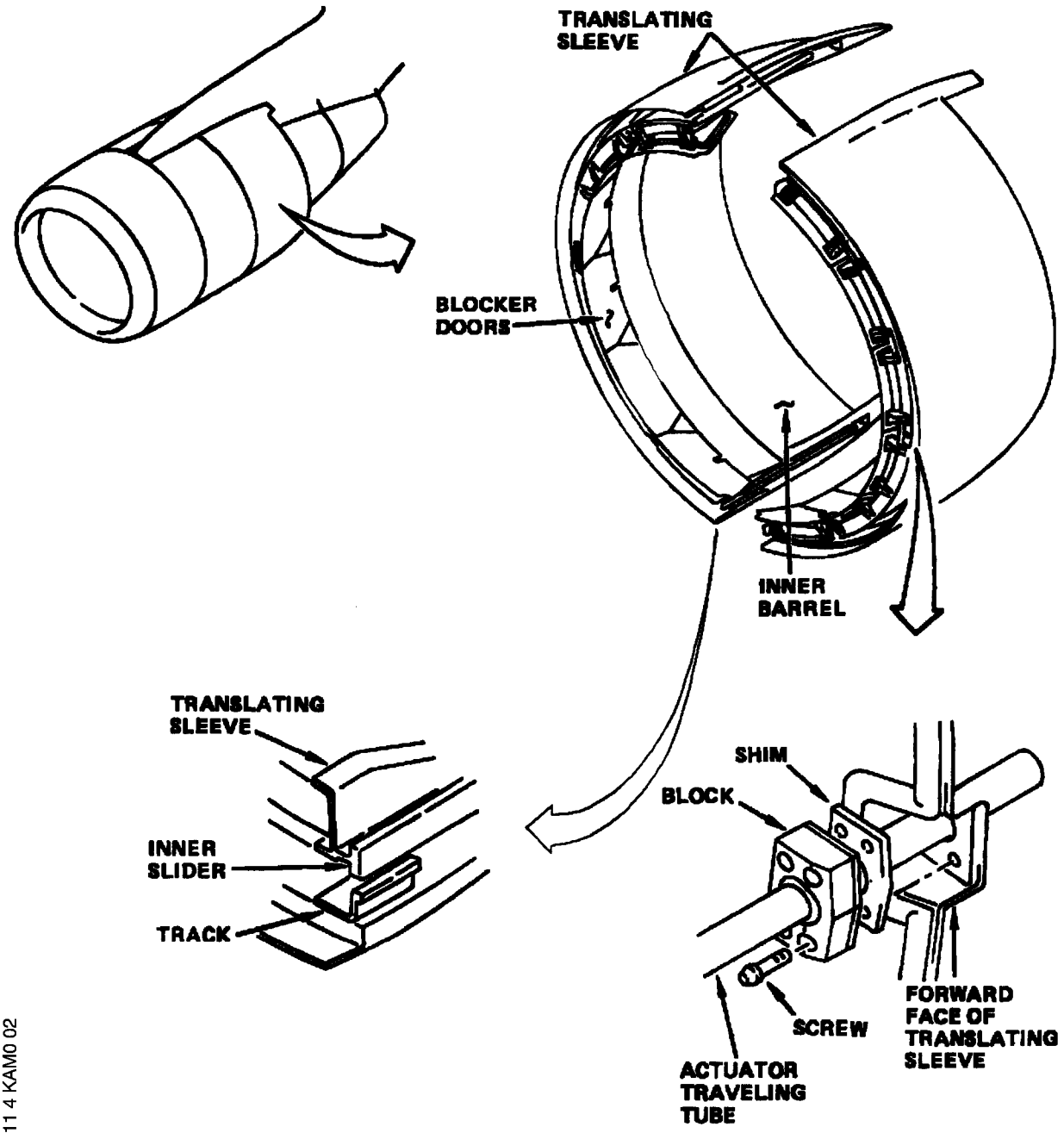
(7)Manually deploy translating sleeve approximately 12 in. (304.8 mm) from fully stowed position to allow attachment of blocker door links.

(8)Remove temporary restraints on blocker doors and attach blocker door links to blocker doors with bolts, washers, bushings and nuts. TORQUE
R nuts to between 100 and 140 lbf.in. (1.13 and 1.58 m.daN).
R NOTE : On alternate spring link configuration, attach blocker door
R links to blocker doors with bolts and nuts. TORQUE the nuts to
R between 160 and 190 lbf.in. (1.81 and 2.15 m.daN).

(9)Manually stow translating sleeve and recheck gap (Ref. 78-31-15, P. Block 201).

(10)(Pre SB PW4NAC 78-78) Measure gaps between translating sleeve (5) and the aft support cascade frames (10) using a feeler gage (Ref. Fig. 403).

(a)Ensure that the translating sleeve (5) is in the fully deployed



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PW C

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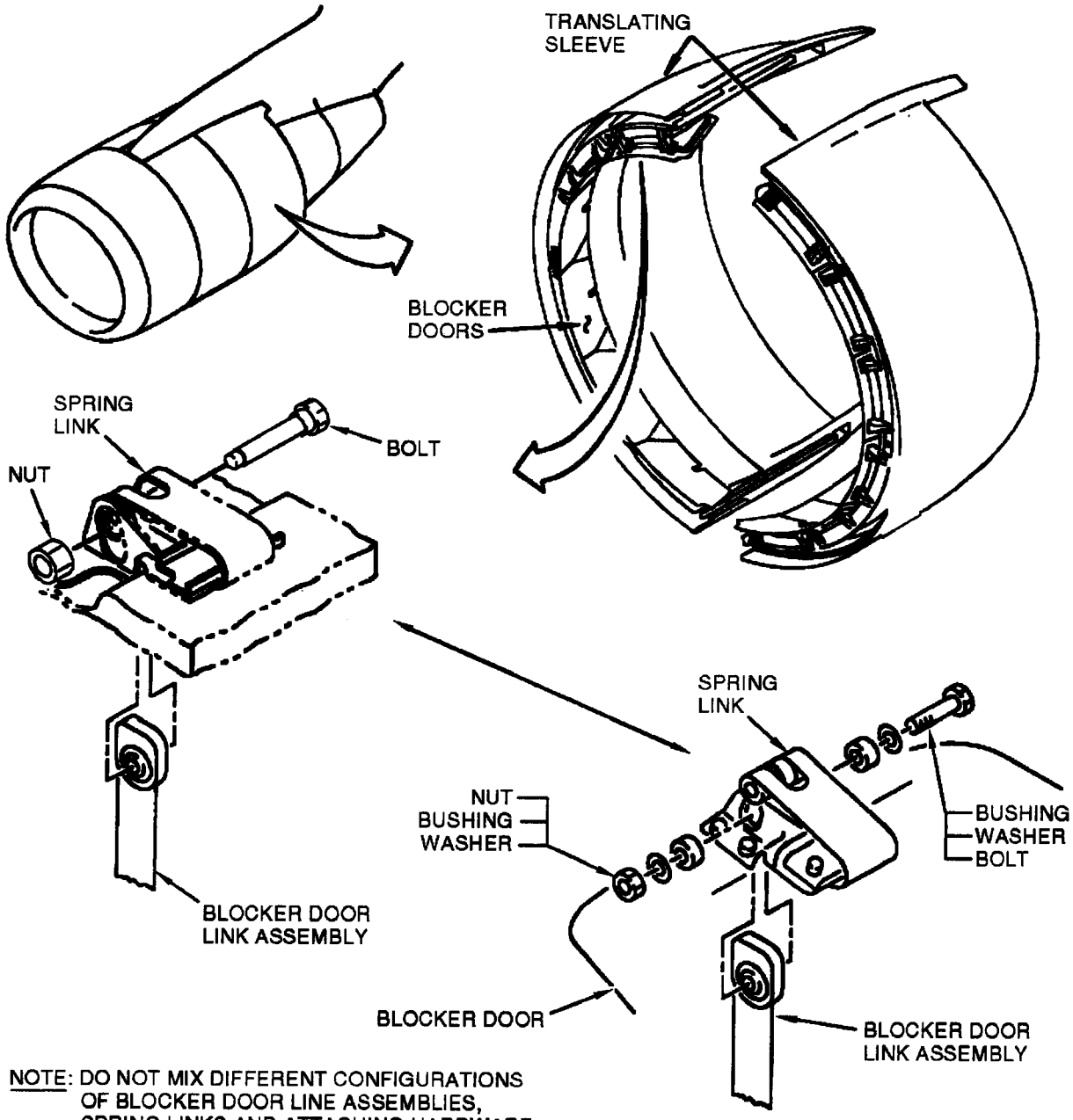
Translating Sleeve Attach Points
Figure 401

R



NOTE: DO NOT MIX DIFFERENT CONFIGURATIONS OF BLOCKER DOOR LINE ASSEMBLIES, SPRING LINKS AND ATTACHING HARDWARE.

BM5 78 32 11 4 KFM0 00

L-A512R (0708)
PW C

R Translating Sleeve Attach Points
Figure 402

position and latched before taking measurements.

(b)Remove cascade assemblies (Ref. 78-32-12, P. Block 401) to expose the pad assemblies. For affected cascades (Ref. Fig. 407).

(c)Locate pad assemblies (15) at five locations on the aft support frame (10). At these five locations, measure the gap between the translating sleeve inner panel and the aft support frame.
Maintain a nominal gap of 0.010 - 0.080 in. (0.25 - 2.03 mm).

NOTE : If the gap requirements are not met, stow the translating sleeve and shim (20) as required to maintain the specified gap limits.
If the gap requirements cannot be met by adding or removing shim(s) it may be necessary to remove and trim ramps (Ref. Fig. 404).

1 Remove rivets (25). Install shims (20) as necessary. Use any combination of shims or plate (30) to maintain the nominal gap requirement between the translating sleeve inner panel and the aft cascade support frame.

WARNING : BEFORE YOU USE CHEMICALS, READ UNDERSTAND, AND OBEY ALL SAFETY INSTRUCTIONS FOR THE CHEMICALS.
THESE INSTRUCTIONS INCLUDE INSTRUCTIONS FROM THE MANUFACTURER, THE MATERIAL SAFETY DATA SHEET (MSDS), AND GOVERNMENT REGULATIONS. CHEMICALS MAY CAUSE INJURY TO YOU OR MAKE YOU SICK WHEN SAFETY INSTRUCTIONS ARE NOT OBEYED. AN MSDS GIVES INSTRUCTIONS ON HOW YOU MUST SAFELY USE, KEEP, AND DISCARD CHEMICALS. GET INSTRUCTIONS FROM YOUR EMPLOYER ON HOW YOU MUST SAFELY USE, KEEP, AND DISCARD CHEMICALS.

2 Clean frame (10), shims (20), plate (30), and pad (15) using a clean cloth moistened with Material No. P11-043. Wipe surfaces dry before solvent evaporates.

WARNING : MATERIAL NO. P18-015 (463-6-27 BASE, X337 CONVERTER, AND TL52-66 THINNER) IS FLAMMABLE AND THE VAPOR IS HARMFUL. INHALATION OF SPRAY MIST MAY CAUSE SERIOUS BODILY HARM. AVOID SOURCES OF IGNITION. USE ONLY IN AREAS WITH ADEQUATE VENTILATION. WORK PERFORMED IN CONFINED AREAS REQUIRES THE USE OF ADDITIONAL FORCED MECHANICAL VENTILATION. AVOID BREATHING OF VAPOR AND CONTACT WITH SKIN AND EYES. IT MAY CAUSE IRRITATION TO SKIN AND EYES. SEVERE OVEREXPOSURE MAY CAUSE FATIGUE, WEAKNESS, CONFUSION, HEADACHE, DIZZINESS, DROWSINESS, AND IMPAIRED JUDGEMENT. USE REGULATORY AGENCY APPROVED RESPIRATORY PROTECTION FOR SPRAY APPLICATIONS. THIS PRODUCT CONTAINS LEAD, A CUMULATIVE POISON. WASH HANDS WELL BEFORE EATING, DRINKING OR SMOKING. PROTECTIVE GLOVES SHOULD BE WORN DURING MIXING APPLICATION. PROLONGED OR REPEATED CONTACT WITH EPOXY PRIMER MAY RESULT IN A PERMANENT SKIN ALLERGY TO 463-6-27 BASE AND X337 CONVERTER. PRIOR TO USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

3 Mix Material No. P18-015 in accordance with manufacturer's

instructions.

4 Wet install rivets (25) to attach each pad (15) as required. Wet install shims (20) and plates (30) as necessary.

5 If gap requirement between the translating sleeve inner panel and aft cascade support frame is not achieved, proceed with ramp removal and trim procedure.

6 Locate the ramps on the translating sleeve inner panel, five locations each side (Ref. Fig. 405).

7 Remove rivets (10) from the ramps (5) (Ref. Fig. 404).

CAUTION : THE WEAR SURFACE MUST REMAIN INTACT. DO NOT REMOVE MATERIAL FROM THE WEAR SURFACE.

8 Remove up to 0.060 in. (1.52 mm) from the face of the ramp.

9 Wipe the surface with a clean cloth wet with Material No. P11-043. Wipe dry before the solvent evaporates.

WARNING : MATERIAL NO. P05-127 (ALODINE 1200) IS CORROSIVE AND MAY CAUSE SERIOUS BODILY HARM. MIST OR DUST MAY CAUSE IRRITATION TO THE NOSE, THROAT, AND LUNGS. PROTECTIVE GLOVES AND CHEMICAL GOGGLES MUST BE WORN TO PREVENT CONTACT. SWABS OR CLOTH SATURATED WITH SOLUTION CONSTITUTE A FIRE HAZARD IF ALLOWED TO DRY. RINSE THESE MATERIALS THOROUGHLY WITH CLEAN, COLD WATER AFTER USE. ALODINE IS AN OXIDIZER. AVOID CONTACT WITH COMBUSTIBLE MATERIALS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

10 Use a nylon brush or cheesecloth swab and apply Material No. P05-127 to the reworked ramp surface. Keep the surface wet with fresh solution for two to five (2 to 5) minutes. Do not allow the solution to dry on the surface.

11 Rinse surface thoroughly with clean water and wipe dry. Take precaution not to penetrate the alodine coating.

12 Apply Material No. P18-015 mixture 0.5 - 0.7 mils thick (0.0127 - 0.0158 mm) to the surface.

13 Allow Material No. P18-015 mixture to dry for two (2) hours at room temperature (65 - 75 degrees F or 18.3 - 23.9 degrees C).

Option : Force dry for 15 minutes at 140 - 180 degrees F (60 - 82.2 degrees C).

14 Install the reworked ramps at locations "A" and "B" shown in (Ref. Fig. 406). Use Material No. P08-015 to wet install the rivets to secure the ramp to the translating sleeve. Length of the rivet will be dependent upon the thickness of the trimmed ramp.

(11)(Post SB PW4NAC 78-78) Measure gaps between translating sleeve (5) and the aft support cascade frames (10) using a feeler gage (Ref. Fig. 403).

(a)Ensure that the translating sleeve (5) is in the fully deployed position and latched before you take measurements.

(b)Remove cascade assemblies (Ref. 78-32-12, P. Block 401) to expose the pad assemblies.

(c)Locate the pad assemblies (15) at five locations on the aft support frame (10). At these five locations, measure the gap between the translating sleeve inner panel and the aft support frame.

Maintain a nominal gap of 0.010 - 0.080 in. (0.25 - 2.03 mm).

NOTE : If the gap requirements are more than the nominal gap, (Ref. 78-32-16, P. Block 401) for the shimming procedure (Ref. Fig. 403).
If there is a hard contact between the translating sleeve and the aft cascade frame, it will be necessary to remove and trim the pad assemblies (Ref. Fig. 404).
If hard contact continues to be after you trim the pads, it will be necessary to remove and trim the ramps (Ref. Fig. 405).

1 Remove the rivets (25) from the pad assembly (15). Use a combination of shims (20) or plates (30) to maintain the nominal gap requirement between the translating sleeve inner panel and the aft cascade support frame. Drill 0.128 - 0.134 in. (3.25 - 3.40 mm) diameter holes for shims and/or plates that are blank (Ref. Fig. 403).

WARNING : BEFORE YOU USE CHEMICALS, READ UNDERSTAND, AND OBEY ALL SAFETY INSTRUCTIONS FOR THE CHEMICALS. THESE INSTRUCTIONS INCLUDE INSTRUCTIONS FROM THE MANUFACTURER, THE MATERIAL SAFETY DATA SHEET (MSDS), AND GOVERNMENT REGULATIONS. CHEMICALS MAY CAUSE INJURY TO YOU OR MAKE YOU SICK WHEN SAFETY INSTRUCTIONS ARE NOT OBEYED. AN MSDS GIVES INSTRUCTIONS ON HOW YOU MUST SAFELY USE, KEEP, AND DISCARD CHEMICALS. GET INSTRUCTIONS FROM YOUR EMPLOYER ON HOW YOU MUST SAFELY USE, KEEP, AND DISCARD CHEMICALS.

2 Clean frame (10), shims (20), plate (30), and pad (15) using a clean cloth moistened with Material No. P11-043. Wipe surfaces dry before solvent evaporates.

WARNING : MATERIAL NO. P18-015 (463-6-27 BASE, X337 CONVERTER, AND TL52-66 THINNER) IS FLAMMABLE AND THE VAPOR IS HARMFUL. INHALATION OF SPRAY MIST MAY CAUSE SERIOUS BODILY HARM. AVOID SOURCES OF IGNITION. USE ONLY IN AREAS WITH ADEQUATE VENTILATION. WORK PERFORMED IN CONFINED AREAS REQUIRES THE USE OF ADDITIONAL FORCED MECHANICAL VENTILATION. AVOID BREATHING OF VAPOR AND CONTACT WITH SKIN AND EYES. IT MAY CAUSE IRRITATION TO SKIN AND EYES. SEVERE OVEREXPOSURE MAY CAUSE FATIGUE, WEAKNESS, CONFUSION, HEADACHE, DIZZINESS, DROWSINESS, AND IMPAIRED JUDGEMENT. USE REGULATORY AGENCY APPROVED RESPIRATORY PROTECTION FOR SPRAY APPLICATIONS. THIS PRODUCT CONTAINS LEAD, A CUMULATIVE POISON. WASH HANDS WELL BEFORE EATING, DRINKING OR SMOKING. PROTECTIVE GLOVES SHOULD BE WORN DURING MIXING APPLICATION. PROLONGED OR REPEATED CONTACT WITH EPOXY PRIMER MAY RESULT IN A PERMANENT SKIN ALLERGY TO 463-6-27 BASE AND X337 CONVERTER. PRIOR TO USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

3 Mix Material No. P18-015 in accordance with manufacturer's instructions.

4 Wet install rivets (25) to attach each pad (15) as required. Wet install shims (20) and plates (30) as necessary.
NOTE : If there is hard contact between the translating sleeve and aft cascade support frame, and minimal gap cannot be achieved, proceed with pad/ramp removal and trim procedure, as necessary.
5 Remove pads (15) (Ref. Fig. 404).
6 Remove up to 0.020 in. (0.508 mm) material from the chamfered side of the pad. Minimum pad thickness of 0.040 in. (1.016 mm) must be maintained.
7 Secure pad to the frame. Use primer Material No. P18-015 to wet install rivets (10) of proper length for the thickeness of remaining pad.
NOTE : Measure gap between aft cascade frame and translating sleeve. If minimal gap requirements are not achieved, it will be necessary to remove and trim ramps.
8 Locate ramps on translating sleeve inner panel, five locations each side.
9 Remove rivets from ramps (3) (Ref. Fig. 405).
CAUTION : DO NOT REMOVE MATERIAL FROM THE WEAR SURFACE.
10 Remove up to 0.060 in. (1.52 mm) from the face of the ramp.
11 Wipe the surface with a clean cloth wet with Material No. P11-043. Wipe dry before the solvent evaporates.
WARNING : MATERIAL NO. P05-127 (ALODINE 1200) IS CORROSIVE AND MAY CAUSE SERIOUS BODILY HARM. MIST OR DUST MAY CAUSE IRRITATION TO THE NOSE, THROAT, AND LUNGS. PROTECTIVE GLOVES AND CHEMICAL GOGGLES MUST BE WORN TO PREVENT CONTACT. SWABS OR CLOTH SATURATED WITH SOLUTION CONSTITUTE A FIRE HAZARD IF ALLOWED TO DRY. RINSE THESE MATERIALS THOROUGHLY WITH CLEAN, COLD WATER AFTER USE. ALODINE IS AN OXIDIZER. AVOID CONTACT WITH COMBUSTIBLE MATERIALS. PRIOR TO THE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.
12 Use a nylon brush or cheesecloth swab and apply Material No. P05-127 to the reworked ramp surface. Keep the surface wet with fresh solution for 2 to 5 minutes. Do not allow the solution to dry on the surface.
13 Rinse surface thoroughly with clean water and wipe dry. Take precaution not to penetrate the alodine coating.
14 Apply primer Material No. P18-015 mixture 0.5 - 0.7 mils thick (0.0127 - 0.0158 mm) to surface.
15 Allow primer Material No. P18-015 mixture to dry for two hours at room temperature 65 - 75 degrees F (18.3 - 23.9 degrees C), or force dry for 15 minutes at 140 - 180 degrees F (60 - 82.2 degrees C).
16 Secure ramps to the translating sleeve. At "A" locations shown in (Ref. Fig. 406), wet install two rivets (10), and one rivet (15) with Material No. P18-015. Length of rivet is determined by thickness of the trimmed ramp.
17 Secure remaining ramps to the tranlating sleeve. At "B"

locations shown in (Ref. Fig. 406) wet install two rivets (10), and one rivet (15) with Material No. P18-015. Length of rivet is determined by thickness of trimmed ramp.

NOTE : If gap requirements are not achieved per procedure, refer to Service Bulletin PW4NAC 78-78 for additional rework.

(12)Check torque required to manually deploy and stow translating sleeve (Ref. 78-32-11, P. Block 201).

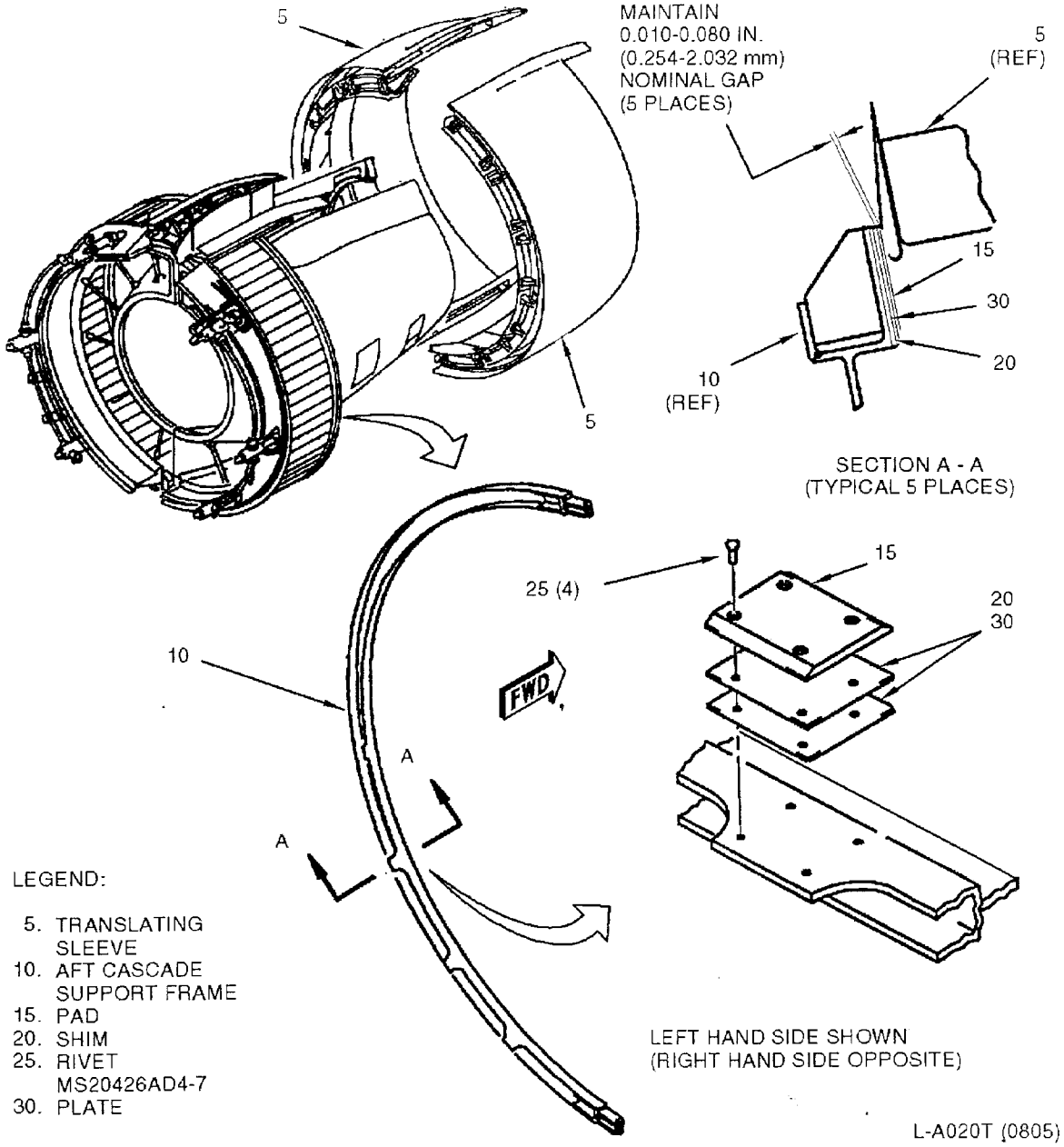
(13)Install two cascades adjacent to each actuator (Ref. 78-32-12, P. Block 401).

D. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(2)Remove access platform.

(3)Close fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.



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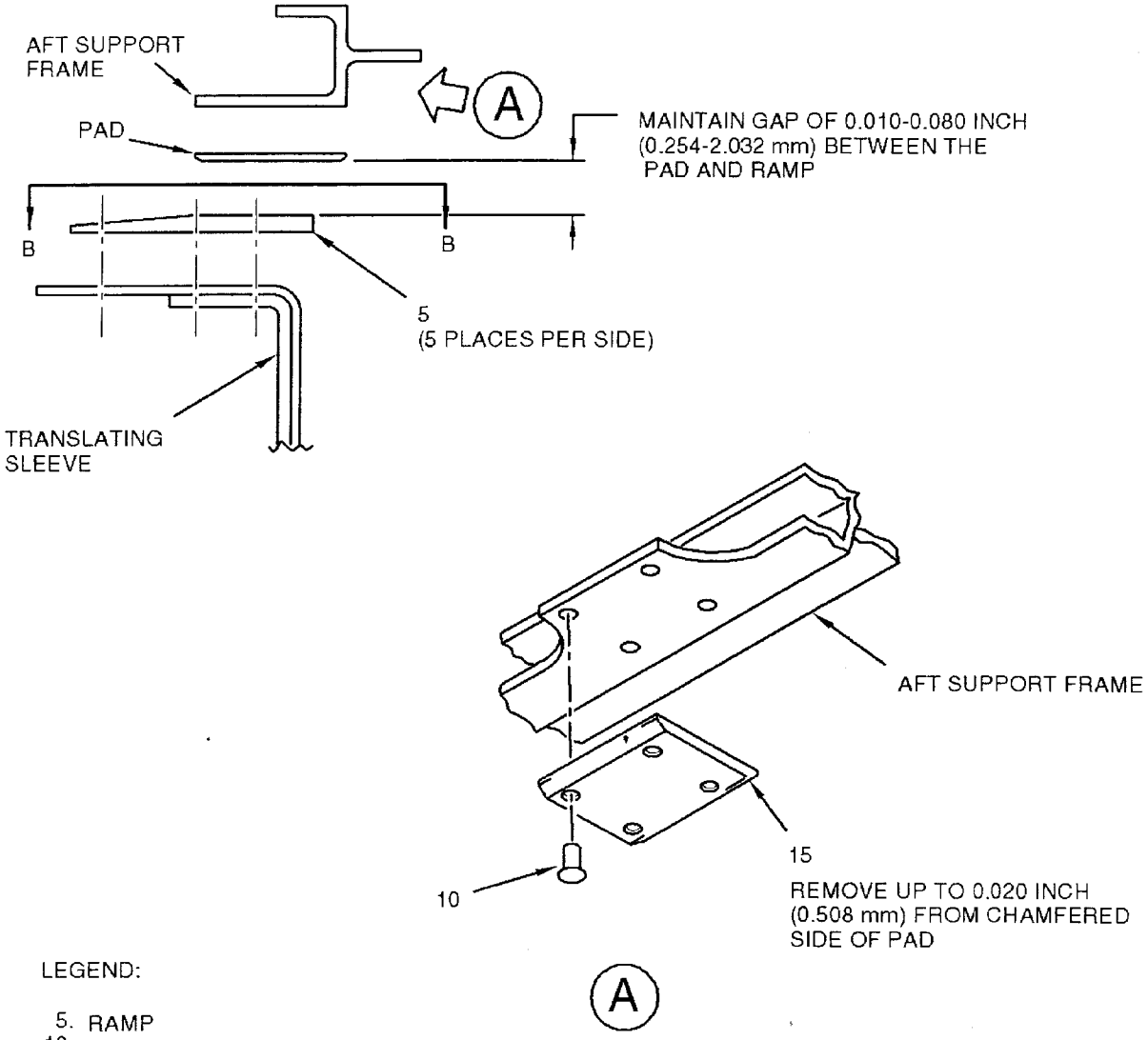
Translating Sleeve Gap Measurements Shim Installation
Figure 403



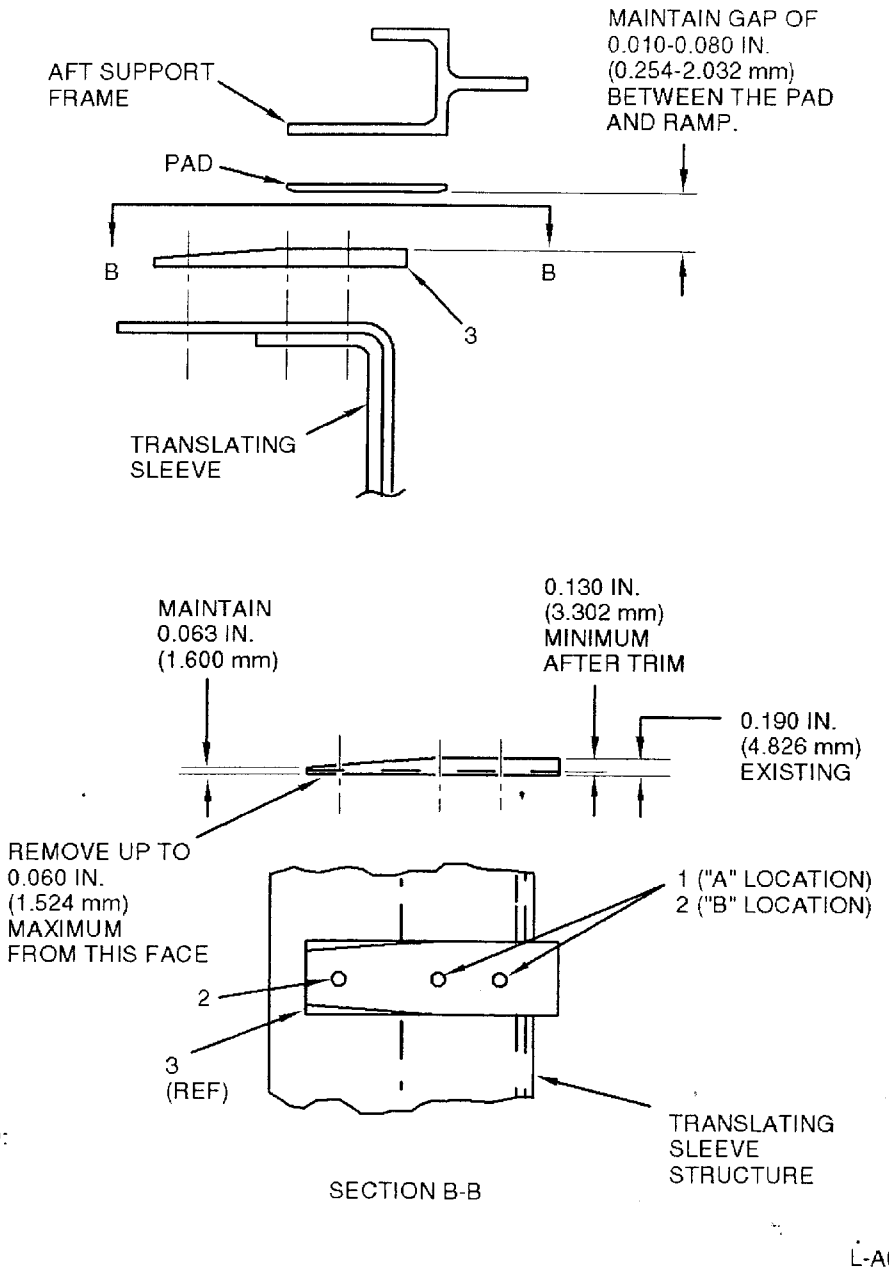
LEGEND:

5. RAMP
10. RIVET NAS1097AD4
15. PAD

L-A025T (0805)

BM5 78 32 11 4 KEM0 01

Translating Sleeve Gap Measurements Pad Trim/Installation
(Less Shim)
Figure 404



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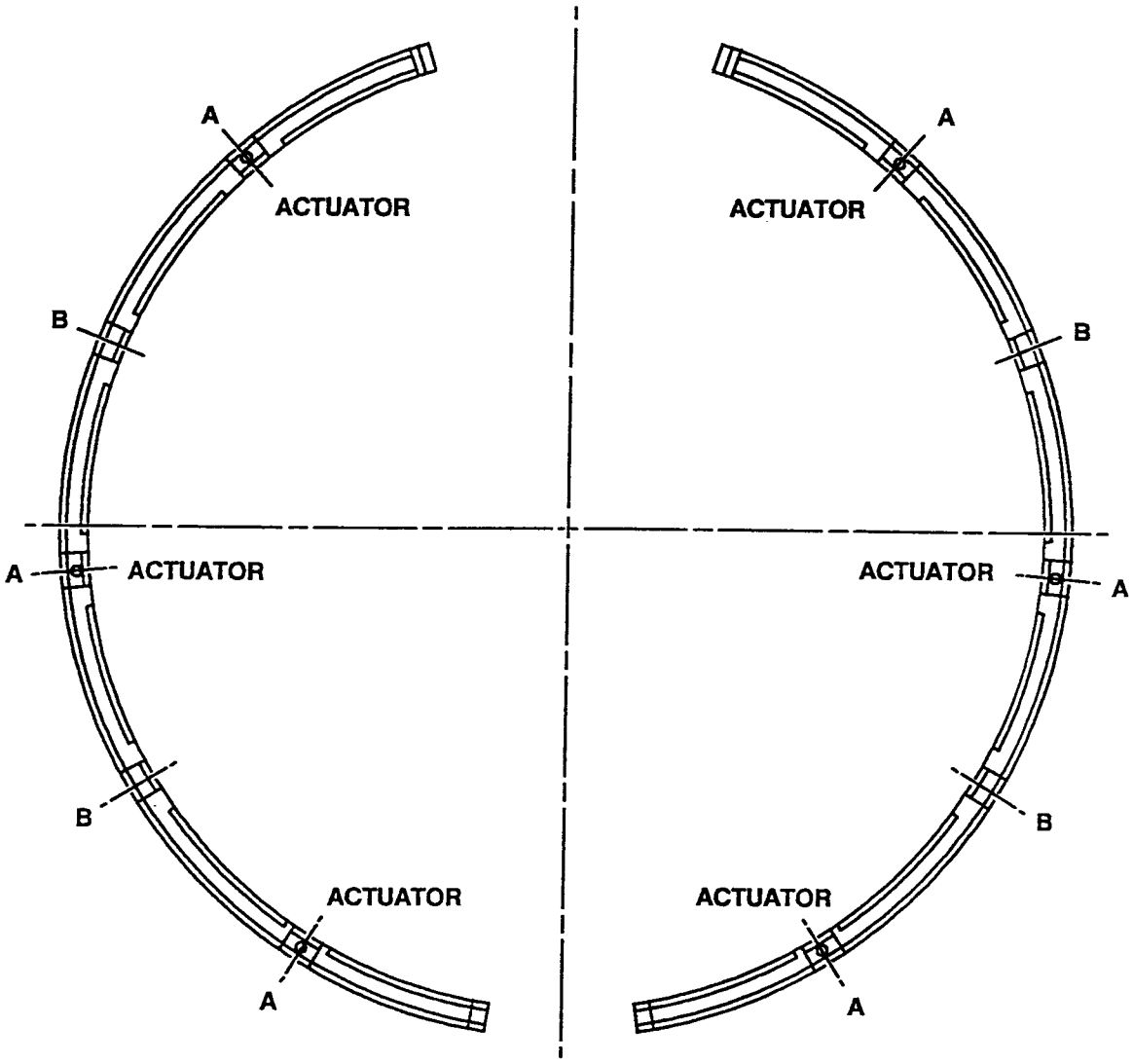
Translating Sleeve Ramp Gap Measurements
Ramp Rework/Installation
Figure 405



VIEW LOOKING FORWARD

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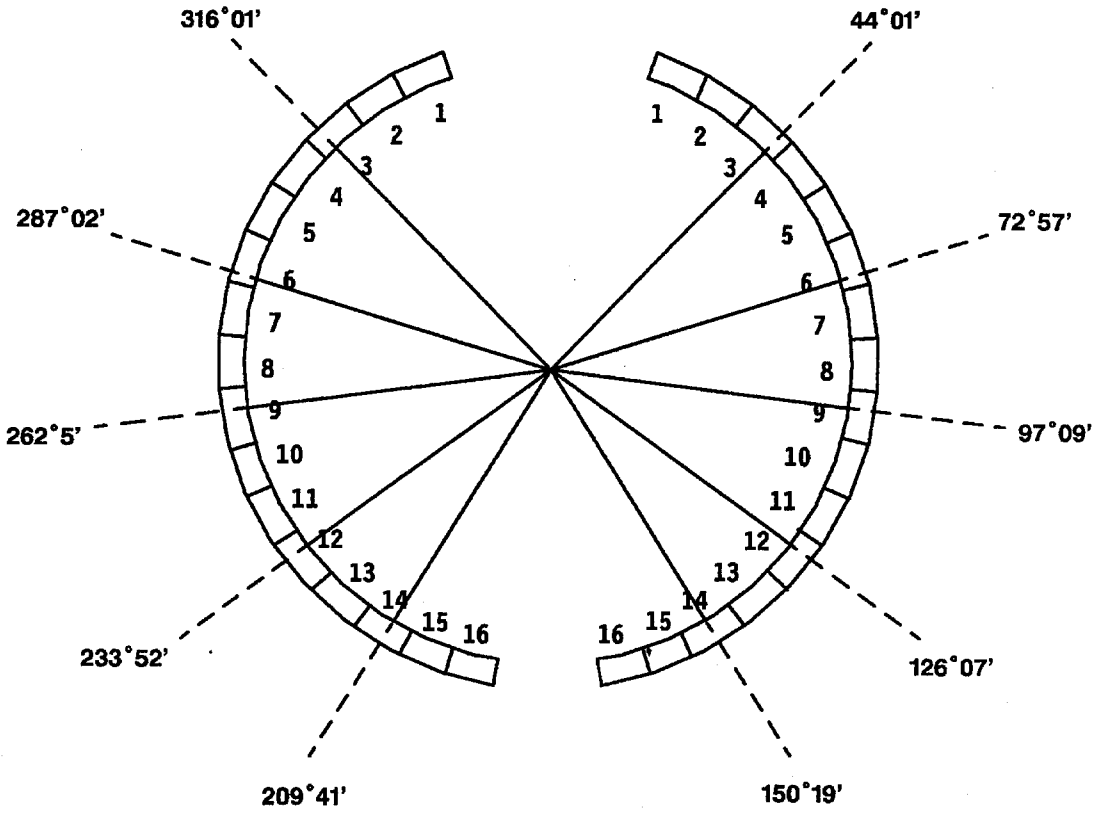
Translating Sleeve Ramp Installation
Figure 406



THRUST REVERSER CASCADE
PAD LOCATIONS

L-A037T

BM5 78 32 11 4 KGMO 00

Thrust Reverser Cascade/Pad Locations
Figure 407

**ON A/C 101-200,

R

THRUST REVERSER TRANSLATING SLEEVES - ADJUSTMENT/TEST

1. Operational Test with an External Source of Pneumatic Power

A. General

(1) This procedure provides an operational test for the thrust reverser translating sleeves. This minimum requirement test operates the translating sleeves with an external source of pneumatic power. For operational test of the actuation system without an external source of pneumatic power, Ref. Para. 2.

(2) This procedure is the same for the right hand and left hand engines.

(3) The following servicing and adjustment/test procedures are applicable to the thrust reverser translating sleeves adjustment/test procedure.

B. Equipment and Materials

ITEM	DESIGNATION
(1)	Circuit Breaker Safety Clips
(2)RSE1079	Air Motor Ground Air Supply Hose
Referenced Procedures	
- 24-41-00, P. Block 301	AC External Power Control
- 36-00-00, P. Block 1	Pneumatic
- 49-00-00, P. Block 501	APU
- 71-00-00, P. Block 201	Engine Operating Limits
- 71-00-00, P. Block 501	Power Plant General
- 71-13-00, P. Block 301	Cowl Doors
- 73-38-00, P. Block 501	FADEC System Indicating

C. Procedure

(1) Job set-up

(a) Open, safety and tag the following circuit breakers for the appropriate engine : 1KM(2KM).

(b) Make sure that the thrust reverser cowl doors are closed.

(c) Verify the following :

1 The thrust reverser cowl doors are closed.

2 The FADEC GRND TEST displays are available on the left and right ECAM (Ref. 73-38-00, P. Block 501).

3 Review the hexadecimal values for labels 352 and 353 on the left FADEC GRND TEST page. Verify that bit 25 for both labels is "0" for CH A and CH B.

(d) Open the right fan cowl doors (Ref. 71-13-00, P. Block 301).

(e) Remove the pneumatic starter duct connection cap and install air motor ground air supply hose (Ref. Fig. 501).

(f) Pull out the lockpin on the ground operation air transfer pneumatic

valve. Hold the handle in the closed position. Remove the valve port cap.

(g)Remove the ground operation air transfer pneumatic valve cap. Hold the handle in the closed position to install the Ground Air Supply hose (Ref. Fig. 501).

CAUTION : MAKE SURE THAT THE INLET PRESSURE IS ABOVE 20 PSIG (137.9 kPa) TO FULLY ENERGIZE THE SYSTEM.

(h)Pressurize the aircraft

1 Using HP ground pneumatic source

- Connect the HP ground air supply unit to the HP ground connector

NOTE : To do this procedure and to test the ENG2 only, open the crossfeed valve as follows :

- On AIR BLEED panel, 436VU.
  . Release the X FEED mode pushbutton switch (MAN legend on)
  . Press the X FEED valve position pushbutton switch (flowbar in line).

2 Start the APU (Ref. 49-00-00, P. Block 501).

- On AIR BLEED panel, 436VU.
- place APU BLEED switch in ON position
  . Put the APU BLEED switch to the ON position (flowbar on the APU BLEED annunciator comes on).
  . Check that the X FEED valve position pushbutton switch flowbar is in line.

CAUTION : MAKE SURE THAT THE INLET PRESSURE IS ABOVE 20 PSIG (137.9 kPa) TO FULLY ENERGIZE THE SYSTEM.

(j)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(k)Make sure that the electronics racks ventilation is correct.

(l)Remove safety, clips and tags and close circuit breakers 1KM(2KM), 3KM(4KM), 45KM(44KM).

(m)At center pedestal, make certain that thrust reverser control lever of the untested engine is below 22°.

D. Test Procedure

WARNING : WHEN YOU DO THIS PROCEDURE, MAKE SURE THAT ALL PERSONS, EQUIPMENT AND TOOLS ARE AWAY FROM THE ENTIRE TRAVEL RANGE OF THE THRUST REVERSER. IF YOU DO NOT DO THIS, INJURY OR DEATH CAN OCCUR.

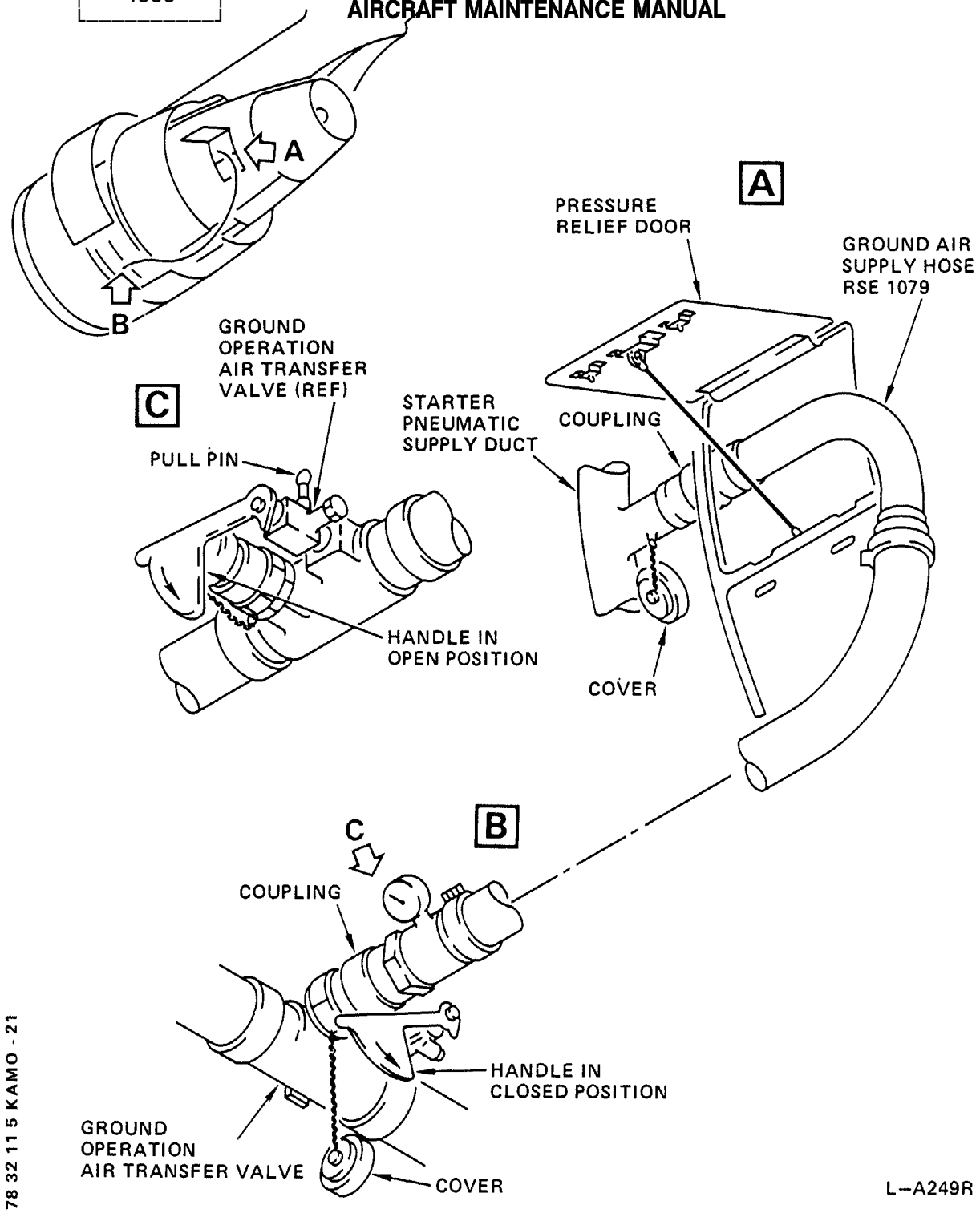
(1)Test the thrust reverser translating sleeves as follows.

**ON A/C 101-200,

(Ref. Fig. 502)

**ON A/C 101-200,

R



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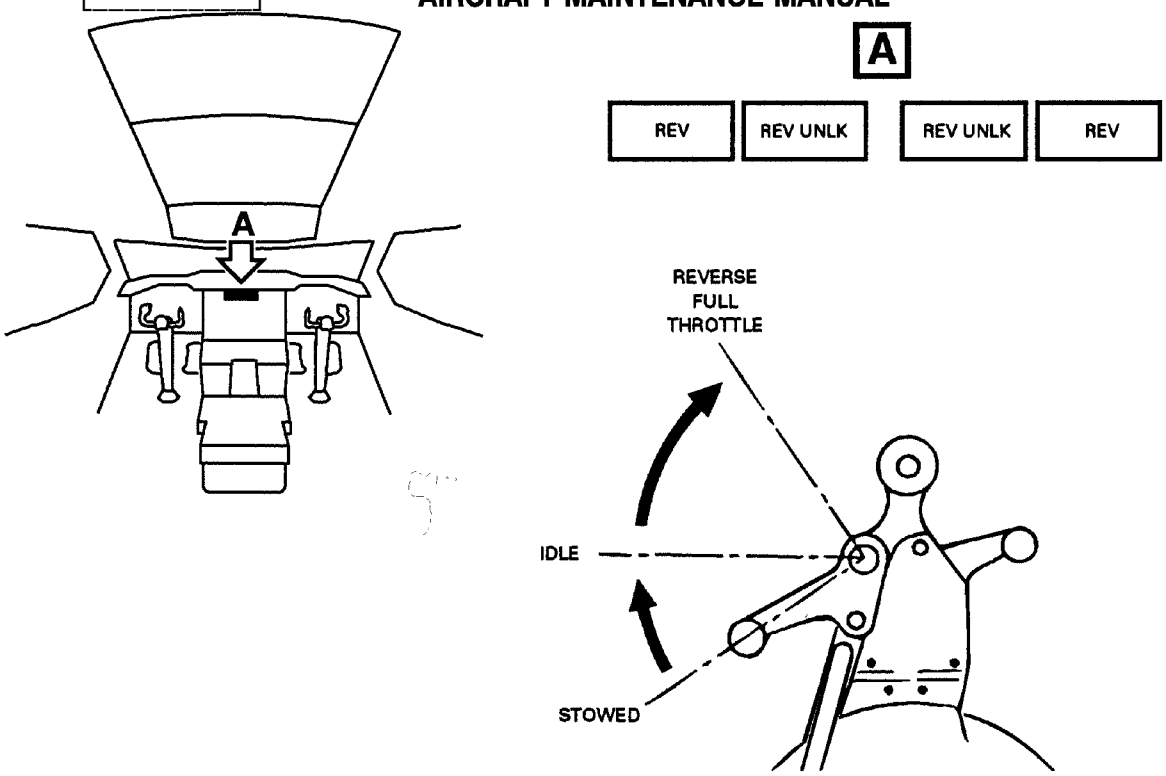
Ground Test Supply Hose
Figure 501



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Engine Thrust Reverser Control and Indication
Figure 502

ACTION	RESULT
1. Move the thrust reverser control lever to the idle position.	Flight compartment observer checks that : - **REV UNLK** warning light comes on as the translating sleeves move from the stowed position. - **REV UNLK** warning light goes off and **REV** indicator light comes on when the reversers reach the deploy position. On the right **ECAM FADEC GRND TEST** display, verify that **REV** percent increases from 0 percent +/- 2 percent to 100 percent +/- 5 percent while the translating sleeves move from the stowed position. From rear of engine ground observer checks that : - Reverser sleeves and all blocker doors translate to the fully deployed position in a smooth motion.
2. Move the thrust reverser control lever to the reverser stowed position	Flight compartment observer checks that : - **REV** indicator light goes off and **REV UNLK** warning light comes on as the translating sleeves move from the fully deployed position. - **REV UNLK** warning light goes off when the translating sleeves reach the fully stowed position. On the right **ECAM FADEC GRND TEST** display, verify that **REV** percent decreases from 100 percent +/- 5 percent to 0 percent +/- 2 percent while the translating sleeves move from the deployed position. From rear of engine, ground observer checks that : - Reverser sleeves and all blocker doors translate to the fully stowed position in a smooth motion. Flight compartment observer review hexadecimal values for Label 352 and Label 353 on the left **FADEC GRND TEST** page. Verify that bit 25 for both labels is "0" for **CH A**

ACTION	RESULT
	and CH B.

(3)Close-up
(a)Open, safety and tag the following circuit breakers for the appropriate engine : 1KM(2KM).
(b)Depressurize the aircraft systems and disconnect the pneumatic ground power unit (Ref. 36-00-00, P. Block 1).
(c)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(d)Disconnect the thrust reverser air motor supply hose and cap duct outlet. On the ground operation air transfer pneumatic valve, cap the valve port. Release handle to the open position and replace the lockpin.
(e)Disconnect the pneumatic duct supply hose and cap the starter duct outlet.
(f)Make certain that the working area is clean and clear of tools and miscellaneous items of equipment.
(g)Close the right fan cowl doors. Remove safety clips and tags and close circuit breakers 1KM(2KM) (Ref. 71-13-00, P. Block 301).
(h)Make certain that throttle control levers are in idle position.

**ON A/C 101-200,

R

2. Operational Test at Ground Idle (Optional)

A. General
(1)This procedure provides instructions for testing the thrust reverser actuation system at ground idle. For operational test of the actuation system using an external source of pneumatic power, Ref. Para. 1.

B. Engine Operating
WARNING : WHEN YOU DO THIS PROCEDURE, MAKE SURE THAT ALL PERSONS, EQUIPMENT AND TOOLS ARE AWAY FROM THE ENTIRE TRAVEL RANGE OF THE THRUST REVERSER. IF YOU DO NOT DO THIS, INJURY OR DEATH CAN OCCUR.
WARNING : ALL SAFETY PRECAUTIONS MUST BE OBSERVED DURING ENGINE OPERATION.
(1)For safety and aircraft immobilization (Ref. 71-00-00, P. Block 501).
(2)Thrust reverser operation with the engines operating will normally be checked automatically every time the thrust reversers are used during landing. If desired, the thrust reverser on a parked aircraft on which the engines are operating may be checked.
(a)It is necessary to move the reverse thrust control lever to reverse idle in order to check thrust reverser operation. This reverse idle position will provide flight idle thrust. Reverse operation is limited

to flight idle thrust for 30 seconds.

(b)Engine operating limits. The prescribed engine limits for forward thrust throttle settings must be observed for engine operation during thrust reverse ground checks (Ref. 71-00-00, P. Block 201).

(3)Check that circuit breakers 1KM(2KM), 3KM(4KM) and 45KM(44KM) are closed.

(4)At center pedestal, make certain that thrust reverser control lever of the untested engine is below 22°.

C. Thrust Reverser Operation Check with Engine Operating :

(1)With the engine operating, actuate the thrust reverser system by moving the thrust reverser control lever to the REVERSE IDLE position.

(a)Flight deck and ground observer determines that :

1 REV UNLK warning light comes on as the translating sleeves move from the stowed position.

2 REV UNLK warning light goes off and REV indicator light comes on when the reversers reach the deploy position.

(2)Place the Reverse Thrust Control Lever in the FORWARD IDLE Position

(a)Flight deck and ground observer determines that :

1 REV indicator light goes off and REV UNLK warning light comes on as the translating sleeves move from the fully deployed position.

2 REV UNLK warning light goes off when the translating sleeves reach the fully stowed position.

D. Close-Up

(1)Shut down the engine (Ref. 71-00-00, P. Block 201).

(2)Make certain that throttle control levers are in idle position.

THRUST REVERSER TRANSLATING SLEEVES - INSPECTION/CHECK

1. Inspect Thrust Reverser Translating Sleeves

A. For Damage Limits (Ref. 71-00-00, P. Block 601).

2. Inspect Thrust Reverser Translating Sleeve Seals

A. Equipment and Material

ITEM	DESIGNATION
Referenced Procedures - 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves

B. Job Set-Up

CAUTION : THRUST REVERSER DOORS MUST BE CLOSED AND LATCHED BEFORE OPERATION OF ANY THRUST REVERSER SYSTEM.

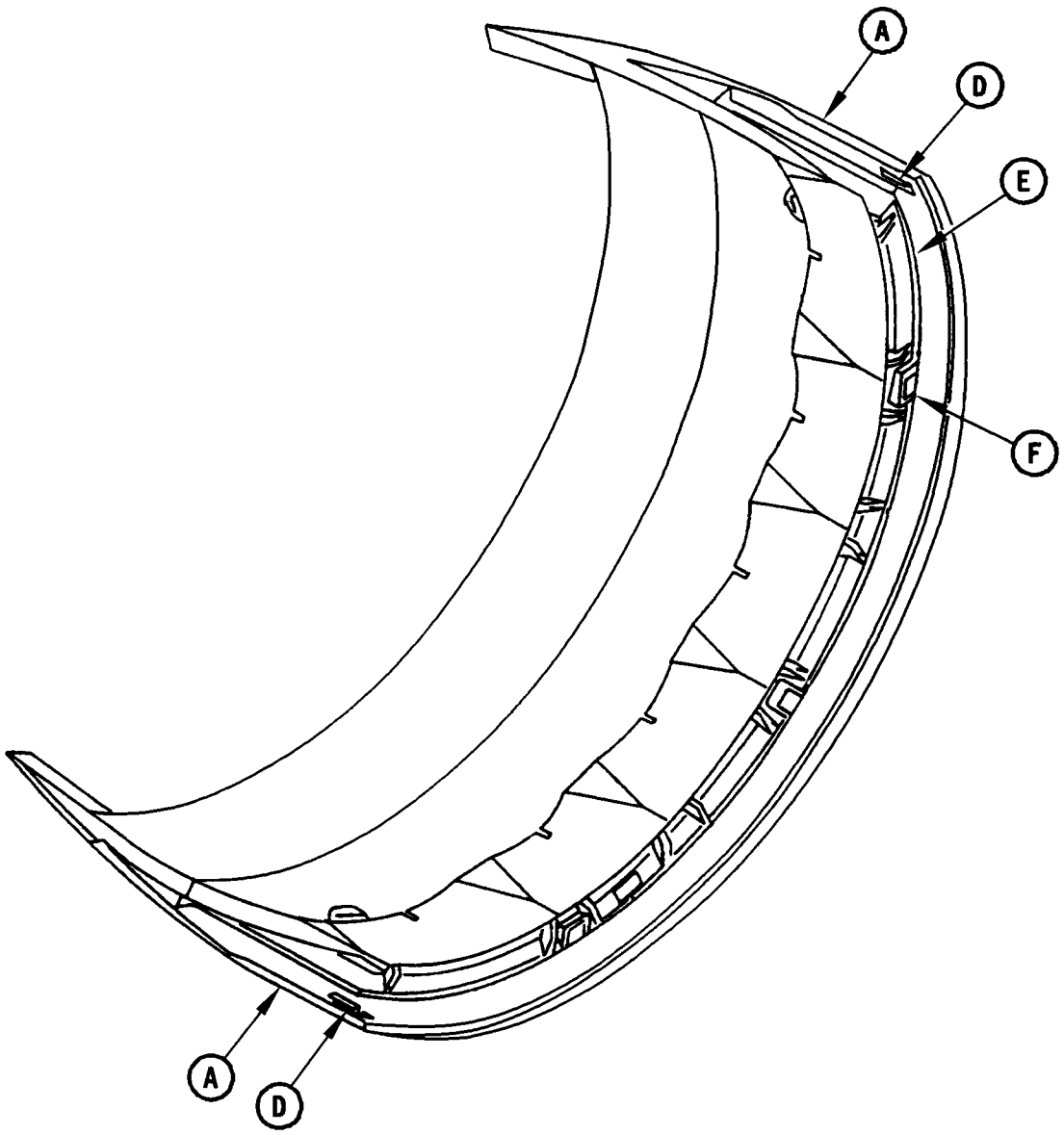
(1)Deploy the translating sleeves (Ref. 78-32-11, P. Block 201).

C. Procedure

(1)Visually inspect all seals for cuts, aging, deterioration, frayed, depressed or flattened areas (Ref. Fig. 601). Replace if damaged.

D. Close-Up

(1)Stow the translating sleeves (Ref. 78-32-11, P. Block 201).



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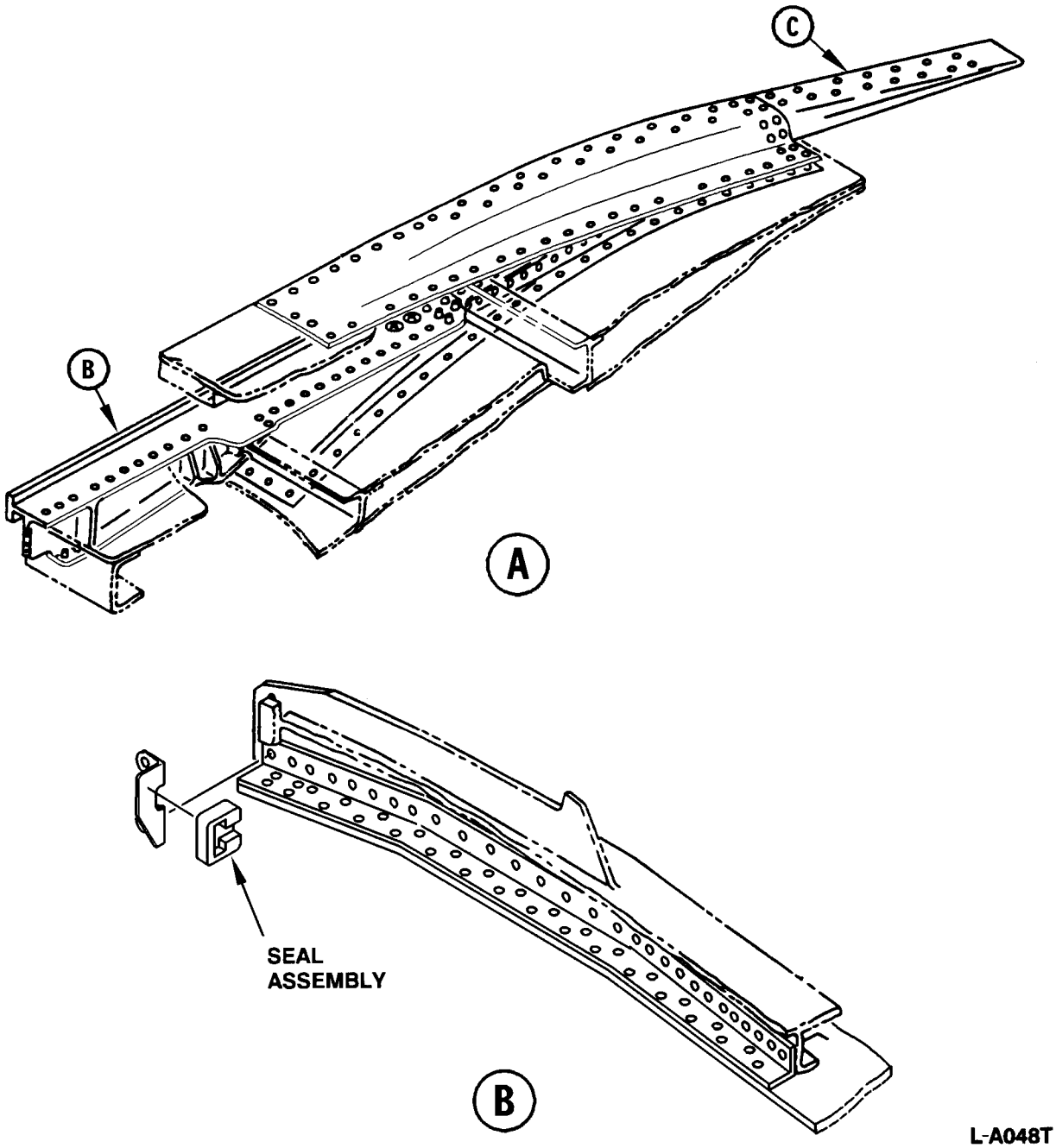
Thrust Reverser Translating Sleeve Seals (Sheet 1)
Figure 601



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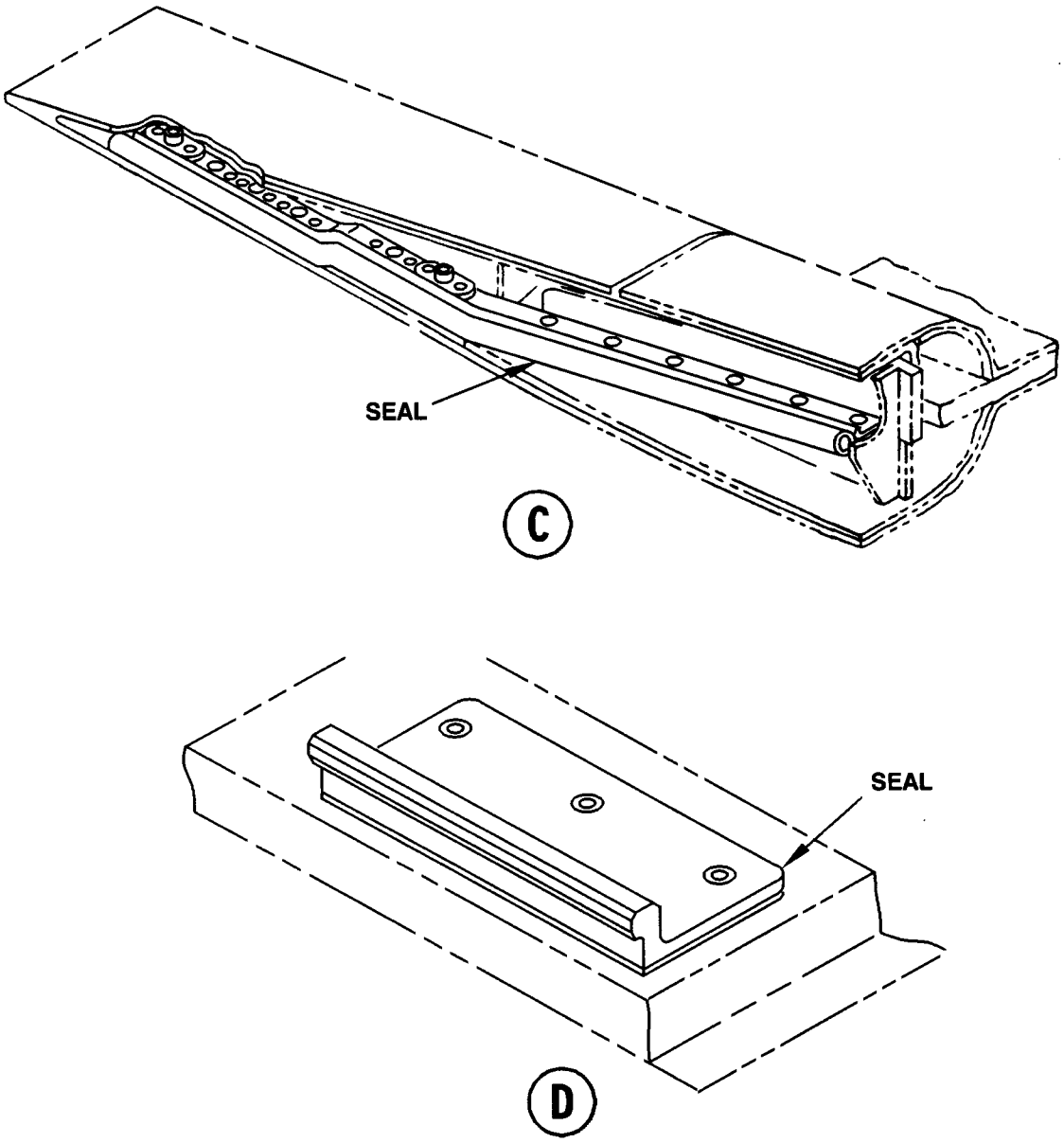
Thrust Reverser Translating Sleeve Seals (Sheet 2)
Figure 601



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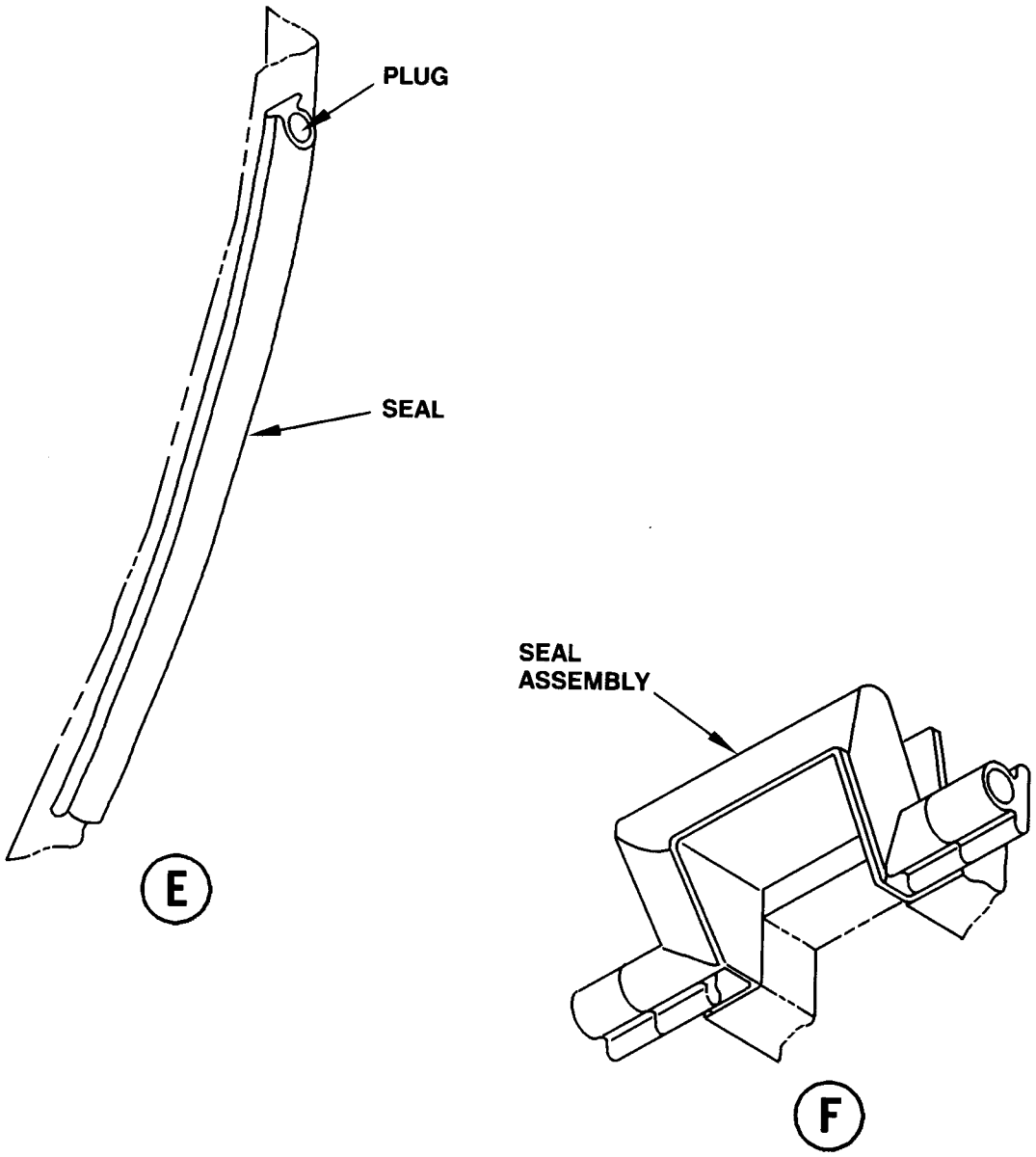
Thrust Reverser Translating Sleeve Seals (Sheet 3)
Figure 601



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Thrust Reverser Translating Sleeve Seals (Sheet 4)
Figure 601

THRUST REVERSER CASCADES - REMOVAL/INSTALLATION

1. Equipment and Materials

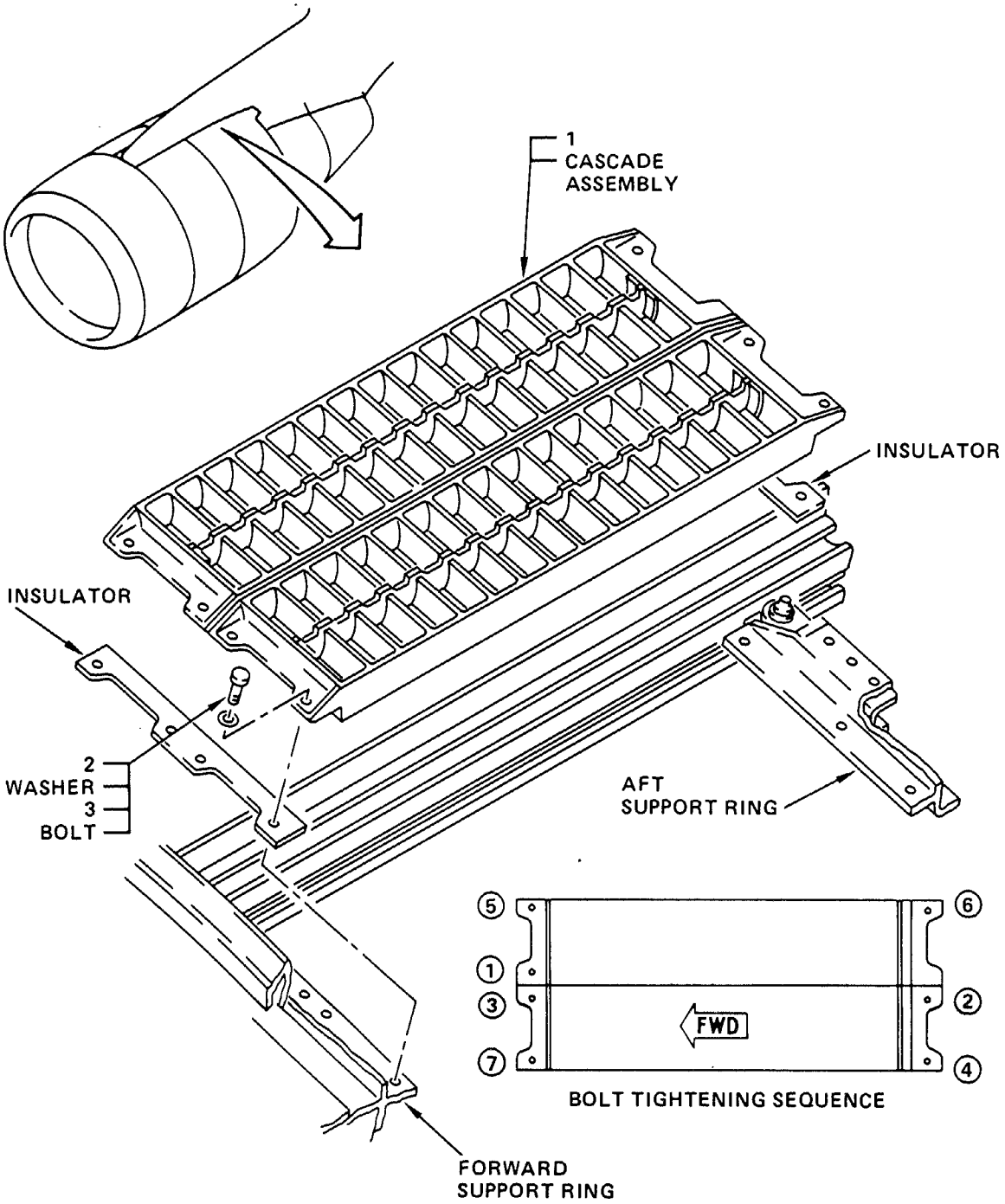
ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breaker safety clips
C. Material No.P09-013	Sealants (Ref. 70-00-00)
D.	Insulator
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 401	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves
- 78-32-16, P. Block 401	Thrust Reverser Cascade Support Frame Assembly
R - 78-32-12, P. Block 501	Thrust Reverser Cascades

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors. (Ref. 71-13-00, P. Block 301).
(2)Install access platform.
(3)Manually translate sleeves to deploy (extend) position. (Ref. 78-32-11, P. Block 201)

B. Removal of Thrust Reverser Cascades
(Ref. Fig. 401)
CAUTION : ONLY ONE CASCADE AT A TIME PER THRUST REVERSER HALF CAN BE REMOVED WITHOUT ADVERSELY AFFECTING CONTOUR OF THE AFT CASCADE SUPPORT FRAME. IF REMOVAL OF CASCADES CAUSES THE AFT CASCADE SUPPORT FRAME TO LOSE CONTOUR, A GAP CHECK BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND THE AFT CASCADE SUPPORT FRAME IS REQUIRED FOR THE GAP CHECK PROCEDURE (REF. 78-32-11, P. BLOCK 401).
CAUTION : FAILURE TO FOLLOW THE CASCADE INSTALLATION INSTRUCTIONS PROPERLY CAN RESULT IN POSSIBLE STRUCTURAL DAMAGE.
R NOTE : For correct cascade part numbers, Ref. 78-32-12, P. Block 501.
(1)Remove bolts (3) and washers (2) attaching cascade (1) to thrust reverser and cascade support rings. Remove cascade (Ref. Fig. 401).
(2)Inspect insulator for any damage. If damage is found, replace the insulator.
(3)Remove all traces of insulator from cascades (1) and from cascade support rings.

C. Installation of Thrust Reverser Cascades
(Ref. Fig. 401)
CAUTION : ENSURE THE CORRECT CASCADES ARE INSTALLED AT THE APPROPRIATE LOCATIONS. INCORRECT CASCADE INSTALLATION MAY AFFECT ENGINE



Thrust Reverser Cascade
Figure 401

PERFORMANCE.

CAUTION : IF MORE THAN ONE CASCADE AT A TIME PER THRUST REVERSER HALF IS REMOVED, A GAP CHECK IS REQUIRED BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND AFT CASCADE SUPPORT FRAME AT CASCADE INSTALLATION (REF. 78-32-16, P. BLOCK 401 FOR DETAILED GAP CHECK PROCEDURE).

NOTE : For correct cascade part numbers, Ref. 78-32-12, P. Block 501.

(1)Install insulator on cascade at all cascade locations.

(2)Align cascade (1) on forward and aft support rings.

WARNING : BEFORE YOU USE CHEMICALS, READ, UNDERSTAND, AND OBEY ALL SAFETY INSTRUCTIONS FOR THE CHEMICALS. THESE INSTRUCTIONS INCLUDE INSTRUCTIONS FROM THE MANUFACTURER, THE MATERIAL SAFETY DATA SHEET (MSDS), AND GOVERNMENT REGULATIONS. CHEMICALS CAN CAUSE INJURY TO YOU OR MAKE YOU SICK WHEN SAFETY INSTRUCTIONS ARE NOT OBEYED. AN MSDS GIVES INSTRUCTIONS ON HOW YOU MUST SAFELY USE, KEEP, AND DISCARD CHEMICALS. GET INSTRUCTIONS FROM YOUR EMPLOYER ON HOW YOU MUST SAFELY USE, KEEP, AND DISCARD CHEMICALS.

R (3)Apply Sealing Compound (Material No.P09-013) to bolts (3). Coat the
R threads, neck and bottom of the bolt head. Install the cascade with
R bolts (3) and washer (2). TORQUE the bolts in sequence to between 50 and 70 lbf.in. (0.57 and 0.79 m.daN).

NOTE : If more than one cascade at a time per thrust reverser half, has been removed, a gap check is required between the translating sleeve inner panel and aft cascade support frame. (Ref. 78-32-11, P. Block 401, for detailed gap check procedure).

D. Close-Up

(1)Manually translate thrust reverser to stowed position (Ref. 78-32-11, P. Block 201).

(2)Check there is no binding while thrust reverser translating sleeves are displaced.

(3)Perform operational test (Ref. 78-32-11, P. Block 501).

(4)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(5)Remove access platform.

(6)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

1. Convert Thrust Reverser Halves

A. General

Thrust reverser conversion procedures are used with Fan Reverser Spare Kits, Left Hand, (P/N 221K9402-63, and -65 (pre-TRIP), P/N 221K9402-69, -71, -73, -75 (TRIP)) consisting of a fan reverser, which have a Systron-Donner Fire Detector system installed.

These conversion instructions provide information required to convert a left wing thrust reverser configuration to a right wing thrust reverser configuration and to convert a right wing thrust reverser configuration to a left wing thrust reverser configuration.

Conversion is accomplished by removing, adding, and relocating various straight and skewed-vaned cascade assemblies.

The additional parts required to accomplish this conversion are furnished with the left wing thrust reverser kit. These parts are packaged separately and are identified as CONVERSION PARTS.

NOTE : For removal or installation of thrust reverser cascade(s), (Ref. 78-32-12, P. Block 401).

B. Procedure

(1)Convert a left wing thrust reverser to a right wing thrust reverser configuration as follows : (Ref. Fig. 501).

CAUTION : ONLY ONE CASCADE AT A TIME PER THRUST REVERSER HALF CAN BE REMOVED WITHOUT ADVERSELY AFFECTING CONTOUR OF THE AFT CASCADE SUPPORT FRAME. IF REMOVAL OF CASCADES CAUSE THE AFT CASCADE SUPPORT FRAME TO LOSE CONTOUR, A GAP CHECK BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND THE AFT CASCADE SUPPORT FRAME IS REQUIRED (REF. 78-32-11, P. BLOCK 401) FOR THE GAP CHECK PROCEDURE.

(a)Remove the following cascade assemblies.

(Ref. Fig. 502) for correct cascade part numbers (pre TRIP).
(Ref. Fig. 503) for correct cascade part numbers (post TRIP).
(Ref. Fig. 501) for correct cascade position.

NOTE : Remove and install only one cascade for a thrust reverser at a time with each procedure.

1 Remove five cascade assemblies from left thrust reverser outboard positions 7, 8, 9, 10 and 11. Tag cascade assemblies as right thrust reverser inboard positions and set aside for later installation. Store three cascades and set aside two cascade assemblies for later installation.

2 Remove five cascade assemblies from left thrust reverser inboard positions 7, 8, 9, 10 and 11. Tag cascade assemblies as right thrust reverser outboard positions and set aside for later installation. Store three cascades and set aside two cascade assemblies for later installation.

R

3 Remove two cascade assemblies from left thrust reverser outboard positions 12 and 13. Tag cascade assemblies as right thrust reverser inboard positions. Set aside two cascade assemblies for later installation.

4 Remove two cascade assemblies from left thrust reverser inboard positions 12 and 13. Tag cascade assemblies as right thrust reverser outboard positions and store.

(b)Install the following cascade assemblies.

R (Ref. Fig. 502) for correct cascade part numbers (pre TRIP).
R (Ref. Fig. 503) for correct cascade part numbers (post TRIP).
R (Ref. Fig. 501) for correct cascade position.

1 Install three cascade assemblies from conversion kit and two removed in Step (1)(a)3, at right thrust reverser inboard positions 7, 8, 9, 10 and 11.

2 Install two cascade assemblies from kit at right thrust reverser inboard positions 12 and 13.

3 Install five cascade assemblies removed in Step (1)(a) 1 at right thrust reverser outboard positions 7, 8, 9, 10 and 11.

4 Install two cascade assemblies removed in Step (1)(a) 2 at right thrust reverser outboard positions 12 and 13.

(c)Tag thrust reverser and revise records to indicate thrust reverser right wing configuration. Identify reconfigured thrust reverser as 221M4126-XXX. Dash number XXX must be the same as the original 221-4126-XXX-dash number.

NOTE : Identification markings shall be permanent, legible and resist deterioration.

(d)To bring the re-configured thrust reverser to the original configuration, strike through the 221M5126-XXX mod number on the nameplate.

NOTE : Strike through the old data in a manner that leaves the old data readable. Do not remove the dash number and/or change letter.
Mark the new dash number and the new change letter on the part.
Mark the letters "RWK", the rework date, and the C.A.G.E. Code of the manufacturer that performed the rework on the part.

(2)Convert a right wing thrust reverser to a left wing thrust reverser configuration as follows : (Ref. Fig. 501).

CAUTION : ONLY ONE CASCADE AT A TIME PER THRUST REVERSER HALF CAN BE REMOVED WITHOUT ADVERSELY AFFECTING CONTOUR OF THE AFT CASCADE SUPPORT FRAME. IF REMOVAL OF CASCADES CAUSE THE AFT CASCADE SUPPORT FRAME TO LOSE CONTOUR, A GAP CHECK BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND THE AFT CASCADE SUPPORT FRAME IS REQUIRED (REF. 78-32-11, P. BLOCK 401) FOR THE GAP CHECK PROCEDURE.

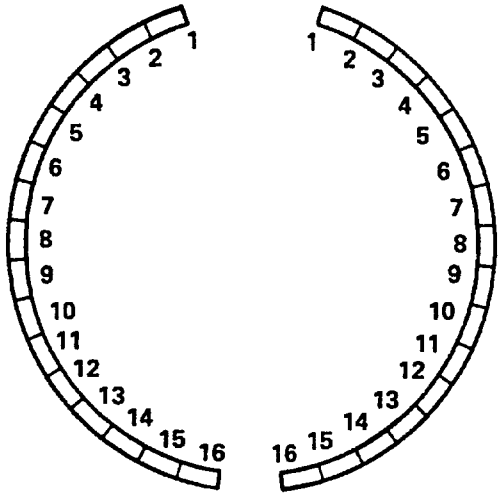
(a)Remove the following cascade assemblies.

R (Ref. Fig. 502) for correct cascade part numbers (pre TRIP).
R (Ref. Fig. 503) for correct cascade part numbers (post TRIP).
R (Ref. Fig. 501) for correct cascade position.

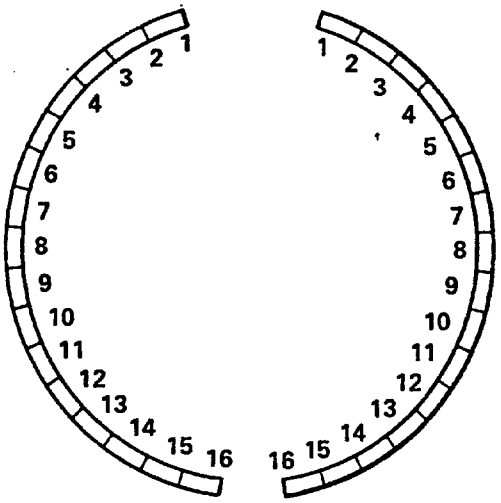
NOTE : Remove and install only one cascade for a thrust reverser at a time.

1 Remove five cascade assemblies from right thrust reverser inboard positions 7, 8, 9, 10 and 11. Tag cascade assemblies as left thrust reverser outboard positions. Store three cascades and set aside two cascade assemblies for later installation.

2 Remove five cascade assemblies from right thrust reverser outboard



LEFT HAND THRUST REVERSER
LOOKING FORWARD



RIGHT HAND THRUST REVERSER
LOOKING FORWARD

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Thrust Reverser Cascade Positions
Figure 501

positions 7, 8, 9, 10 and 11. Tag cascade assemblies as left thrust reverser inboard positions. Set aside cascade assemblies for later installation.

3 Remove two cascade assemblies from right thrust reverser inboard positions 12 and 13. Tag cascade assemblies as left thrust reverser outboard positions and store.

4 Remove two cascade assemblies from right thrust reverser outboard positions 12 and 13. Tag cascade assemblies as left thrust reverser inboard positions and set aside for later installation.

(b) Install the following cascade assemblies.
(Ref. Fig. 502) for correct cascade part numbers (pre TRIP).
(Ref. Fig. 503) for correct cascade part numbers (post TRIP).
(Ref. Fig. 501) for correct cascade position.

1 Install five cascade assemblies removed in Step (2)(a)2 at left thrust reverser outboard positions 7, 8, 9, 10 and 11.

2 Install two cascade assemblies removed in Step (2)(a)4, and three previously stored, at left thrust reverser inboard positions 7, 8, 9, 10 and 11.

3 Install two cascade assemblies removed in Step (2)(a)1 at left thrust reverser outboard positions 12 and 13.

4 Install two cascade assemblies, previously stored, at left thrust reverser inboard positions 12 and 13.

(c) Tag thrust reverser and revise records to indicate thrust reverser
R left wing configuration. Identify reconfigured thrust reverser as 221M4126-XXX. Dash number XXX must be the same as the original 221-4126-XXX-dash number.

NOTE : Identification markings shall be permanent, legible and resist deterioration.

(d) To bring the re-configured thrust reverser to the original configuration, strike through the 221M4126-XXX mod number on the nameplate.

NOTE : Strike through the old data in a manner that leaves the old data readable. Do not remove the dash number and/or change letter.
Mark the new dash number and the new change letter on the part.
Mark the letters "RWK", the rework date, and the C.A.G.E. Code of the manufacturer that performed the rework on the part.

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
8	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
9	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
10	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
11	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
12	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
13	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
14	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
15	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
16	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552

(Counting From Top to Bottom) LH T/R 221-0504-545
No. 1 LH Engine Thrust Reverser, LH Side 221-0504-529
Reversers: 221-4126-501, -509, -517, -525, -541, -553, -561

Table 501 (Sheet 1)

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
8	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
9	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
10	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
11	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
12	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
13	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
14	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
15	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
16	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521

(Counting From Top to Bottom) LH T/R 221-0504-553
No. 1 LH Engine Thrust Reverser, LH Side ALT: 221-0504-549
Reversers: 221-4126-569, -577, -585, -601, -633, -637, -641, -645, -649, -653, -665 221-0504-565 221-0504-569

Table 501 (Sheet 2)

L-D3021 (0705)

BM5 78 32 12 5 KCMA 00

Thrust Reverser Cascades - Pre TRIP
(Sheet 1/6)
Figure 502

R

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
8	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
9	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
10	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
11	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
12	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
13	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
14	221-4543-503	OPT 221-4543-507
15	221-4543-503	OPT 221-4543-507
16	221-4543-503	OPT 221-4543-507

(Counting From Top to Bottom) LH T/R 221-0504-597
No. 1 LH Engine Thrust Reverser, LH Side
Reversers: 221-4126-677, -681, -701, -721, -725, -729

Table 501 (Sheet 3)

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
8	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
9	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
10	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
11	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
12	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
13	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
14	221-4543-504	OPT 221-4543-508
15	221-4543-504	OPT 221-4543-508
16	221-4543-504	OPT 221-4543-508

(Counting From Top to Bottom) RH T/R 221-0504-599
No. 1 LH Engine Thrust Reverser, RH Side
Reversers: 221-4126-669, -673, -713, -717

Table 501 (Sheet 4)

L-D3022 (0705)

BM5 78 32 12 5 KCMB 00

Thrust Reverser Cascades - Pre TRIP
(Sheet 2/6)
Figure 502

R

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
8	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
9	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
10	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
11	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
12	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
13	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
14	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
15	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
16	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522

(Counting From Top to Bottom)
No. 1 LH Engine Thrust Reverser, RH Side
Reversers: 221-4126-573, -581, -589, -605, -613, -657, -661

RH T/R 221-0504-555
ALT: 221-0504-551
221-0504-567
221-0504-571

Table 501 (Sheet 5)

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
8	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
9	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
10	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
11	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
12	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
13	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
14	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
15	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
16	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551

(Counting From Top to Bottom)
No. 1 LH Engine Thrust Reverser, RH Side
Reversers: 221-4126-505, -513, -521, -529, -533, -537, -557, -565

RH T/R 221-0504-541
221-0504-537
221-0504-531

Table 501 (Sheet 6)

L-D3023 (0705)

BM5 78 32 12 5 KCMC 00

Thrust Reverser Cascades - Pre TRIP
(Sheet 3/6)
Figure 502

R

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
8	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
9	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
10	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
11	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
12	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
13	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
14	221-4543-503	OPT 221-4543-507
15	221-4543-503	OPT 221-4543-507
16	221-4543-503	OPT 221-4543-507

(Counting From Top to Bottom) LH T/R 221-0504-601
No. 2 RH Engine Thrust Reverser, LH Side
Reversers: 221-4126-679, -683, -703, -723, -727, -731

Table 501 (Sheet 7)

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
8	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
9	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
10	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
11	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
12	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
13	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
14	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
15	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
16	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521

(Counting From Top to Bottom) LH T/R 221-0504-561
No. 2 RH Engine Thrust Reverser, LH Side ALT: 221-0504-557
Reversers: 221-4126-579, -603, -635, -639, -643, 221-0504-573
-647, -651, -655 221-0504-577

Table 501 (Sheet 8)

L-D3024 (0705)

BM5 78 32 12 5 KCMD 00

Thrust Reverser Cascades - Pre TRIP
(Sheet 4/6)
Figure 502

R

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
8	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
9	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
10	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
11	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
12	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
13	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
14	221-0779-507	OPT 221-0779-501, -503, -509, -511, -513, -515, -517, -519, -521
15	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552
16	221-0778-524	OPT 221-0778-504, -516, -528, -532, -536, -540, -544, -548, -552

(Counting From Top to Bottom) LH T/R 221-0504-547
No. 2 RH Engine Thrust Reverser, LH Side 221-0504-533
Reversers: 221-4126-503, -511, -519, -527, -543, -555, -563

Table 501 (Sheet 9)

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
8	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
9	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
10	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
11	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
12	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
13	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
14	221-4543-504	OPT 221-4543-508
15	221-4543-504	OPT 221-4543-508
16	221-4543-504	OPT 221-4543-508

(Counting From Top to Bottom) RH T/R 221-0504-603
No. 2 RH Engine Thrust Reverser, RH Side
Reversers: 221-4126-671, -675, -715, -719

Table 501 (Sheet 10)

L-D3025 (0705)

BM5 78 32 12 5 KCME 00

Thrust Reverser Cascades - Pre TRIP
(Sheet 5/6)
Figure 502

R

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
8	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
9	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
10	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
11	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
12	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
13	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
14	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
15	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522
16	221-0779-508	OPT 221-0779-502, -504, -510, -512, -514, -516, -518, -520, -522

(Counting From Top to Bottom)
No. 2 RH Engine Thrust Reverser, RH Side
Reversers: 221-4126-575, -583, -591, -607, -615, -659, -663, -671

RH T/R 221-0504-563
ALT: 221-0504-559
221-0504-575
221-0504-579

Table 501 (Sheet 11)

ITEM NO.	PART NUMBER	NOTES
1	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
2	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
3	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
4	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
5	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
6	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
7	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
8	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
9	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
10	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
11	221-0778-521	OPT 221-0778-501, -513, -525, -529, -533, -537, -541, -545, -549
12	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
13	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
14	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
15	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551
16	221-0778-523	OPT 221-0778-503, -515, -527, -531, -535, -539, -543, -547, -551

(Counting From Top to Bottom)
No. 2 RH Engine Thrust Reverser, RH Side
Reversers: 221-4126-507, -515, -523, -531, -535, -539, -559, -567

RH T/R 221-0504-543
221-0504-539
221-0504-535

Table 501 (Sheet 12)

L-D3026 (0705)

BM5 78 32 12 5 KCMF 00

Thrust Reverser Cascades - Pre TRIP
(Sheet 6/6)
Figure 502

R

ITEM NO.	PART NUMBER	NOTES
1	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
2	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
3	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
4	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
5	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
6	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
7	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
8	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
9	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
10	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
11	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
12	221-0778-532	OPT 221-0778-504, -516, -524, -528, -536, -540, -544, -548, -552
13	221-0778-532	OPT 221-0778-504, -516, -524, -528, -536, -540, -544, -548, -552
14	221-4543-503	OPT 221-4543-507
15	221-4543-503	OPT 221-4543-507
16	221-4543-503	OPT 221-4543-507

(Counting From Top to Bottom) LH T/R 221-0504-597
No. 1 LH Engine Thrust Reverser, LH Side
Reversers: 221-4126-1005, -1009, -1017, -1021

Table 502 (Sheet 1)

ITEM NO.	PART NUMBER	NOTES
1	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
2	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
3	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
4	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
5	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
6	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
7	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
8	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
9	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
10	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
11	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
12	221-0778-552	OPT 221-0778-504, -516, -524, -528, -532, -536, -540, -544, -548
13	221-0778-552	OPT 221-0778-504, -516, -524, -528, -532, -536, -540, -544, -548
14	221-4543-507	OPT 221-4543-503
15	221-4543-507	OPT 221-4543-503
16	221-4543-507	OPT 221-4543-503

(Counting From Top to Bottom) LH T/R 221-0504-637
No. 1 LH Engine Thrust Reverser, LH Side
Reversers: 221-4126-1057, -1065, -1069, -1077, -1081, -1089, -1093, -1101, -1105, -1113, -1117, -1125, -1129, -1137, -1141, -1149, -1153, -1161, -1165

Table 502 (Sheet 2)

L-D3027 (0705)

BM5 78 32 12 5 KEMA 00

Thrust Reverser Cascades - Post TRIP
(Sheet 1/4)
Figure 503

R

ITEM NO.	PART NUMBER	NOTES
1	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
2	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
3	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
4	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
5	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
6	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
7	221-0778-531	OPT 221-0778-503, -515, -523, -527, -535, -539, -543, -547, -551
8	221-0778-531	OPT 221-0778-503, -515, -523, -527, -535, -539, -543, -547, -551
9	221-0778-531	OPT 221-0778-503, -515, -523, -527, -535, -539, -543, -547, -551
10	221-0778-531	OPT 221-0778-503, -515, -523, -527, -535, -539, -543, -547, -551
11	221-0778-531	OPT 221-0778-503, -515, -523, -527, -535, -539, -543, -547, -551
12	221-0779-512	OPT 221-0779-502, -504, -508, -510, -514, -516, -518, -522, -520
13	221-0779-512	OPT 221-0779-502, -504, -508, -510, -514, -516, -518, -522, -520
14	221-4543-504	OPT 221-4543-508
15	221-4543-504	OPT 221-4543-508
16	221-4543-504	OPT 221-4543-508

(Counting From Top to Bottom) RH T/R 221-0504-599
No. 1 LH Engine Thrust Reverser, RH Side
Reversers: 221-4126-1001, -1013

Table 502 (Sheet 3)

ITEM NO.	PART NUMBER	NOTES
1	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
2	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
3	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
4	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
5	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
6	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
7	221-0778-551	OPT 221-0778-503, -515, -523, -527, -531, -535, -539, -543, -547
8	221-0778-551	OPT 221-0778-503, -515, -523, -527, -531, -535, -539, -543, -547
9	221-0778-551	OPT 221-0778-503, -515, -523, -527, -531, -535, -539, -543, -547
10	221-0778-551	OPT 221-0778-503, -515, -523, -527, -531, -535, -539, -543, -547
11	221-0778-551	OPT 221-0778-503, -515, -523, -527, -531, -535, -539, -543, -547
12	221-0779-522	OPT 221-0779-502, -504, -508, -510, -512, -514, -516, -518, -520
13	221-0779-522	OPT 221-0779-502, -504, -508, -510, -512, -514, -516, -518, -520
14	221-4543-508	OPT 221-4543-504
15	221-4543-508	OPT 221-4543-504
16	221-4543-508	OPT 221-4543-504

(Counting From Top to Bottom) RH T/R 221-0504-639
No. 1 LH Engine Thrust Reverser, RH Side
Reversers: 221-4126-1061, -1073, -1085, -1097, -1109, -1121, -1133, -1145, -1157

Table 502 (Sheet 4)

L-D3028 (0705)

BM5 78 32 12 5 KEMB 00

Thrust Reverser Cascades - Post TRIP
(Sheet 2/4)
Figure 503

R

ITEM NO.	PART NUMBER	NOTES
1	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
2	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
3	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
4	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
5	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
6	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
7	221-0778-532	OPT 221-0778-504, -516, -524, -528, -536, -540, -544, -548, -552
8	221-0778-532	OPT 221-0778-504, -516, -524, -528, -536, -540, -544, -548, -552
9	221-0778-532	OPT 221-0778-504, -516, -524, -528, -536, -540, -544, -548, -552
10	221-0778-532	OPT 221-0778-504, -516, -524, -528, -536, -540, -544, -548, -552
11	221-0778-532	OPT 221-0778-504, -516, -524, -528, -536, -540, -544, -548, -552
12	221-0779-511	OPT 221-0779-501, -503, -507, -509, -513, -515, -517, -519, -521
13	221-0779-511	OPT 221-0779-501, -503, -507, -509, -513, -515, -517, -519, -521
14	221-4543-503	OPT 221-4543-507
15	221-4543-503	OPT 221-4543-507
16	221-4543-503	OPT 221-4543-507

(Counting From Top to Bottom) LH T/R 221-0504-601
No. 2 RH Engine Thrust Reverser, LH Side
Reversers: 221-4126-1007, -1011, -1019, -1023

Table 502 (Sheet 5)

ITEM NO.	PART NUMBER	NOTES
1	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
2	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
3	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
4	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
5	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
6	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
7	221-0778-552	OPT 221-0779-502, -504, -508, -510, -512, -514, -516, -518, -520
8	221-0778-552	OPT 221-0779-502, -504, -508, -510, -512, -514, -516, -518, -520
9	221-0778-552	OPT 221-0779-502, -504, -508, -510, -512, -514, -516, -518, -520
10	221-0778-552	OPT 221-0779-502, -504, -508, -510, -512, -514, -516, -518, -520
11	221-0778-552	OPT 221-0779-502, -504, -508, -510, -512, -514, -516, -518, -520
12	221-0779-521	OPT 221-0779-501, -503, -507, -509, -511, -513, -515, -517, -519
13	221-0779-521	OPT 221-0779-501, -503, -507, -509, -511, -513, -515, -517, -519
14	221-4543-507	OPT 221-4543-503
15	221-4543-507	OPT 221-4543-503
16	221-4543-507	OPT 221-4543-503

(Counting From Top to Bottom) LH T/R 221-0504-641
No. 2 RH Engine Thrust Reverser, LH Side
Reversers: 221-4126-1053, -1055, -1059, -1067, -1071, -1079, -1083, -1091, -1095, -1103, -1107, -1115, -1119, -1127, -1131, -1139, -1143, -1151, -1155, -1163, -1167

Table 502 (Sheet 6)

L-D3029 (0705)

BM5 78 32 12 5 KEMC 00

Thrust Reverser Cascades - Post TRIP
(Sheet 3/4)
Figure 503

R

ITEM NO.	PART NUMBER	NOTES
1	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
2	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
3	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
4	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
5	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
6	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
7	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
8	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
9	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
10	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
11	221-0778-529	OPT 221-0778-501, -513, -521, -525, -533, -537, -541, -545, -549
12	221-0778-531	OPT 221-0778-503, -515, -523, -527, -535, -539, -543, -547, -551
13	221-0778-531	OPT 221-0778-503, -515, -523, -527, -535, -539, -543, -547, -551
14	221-4543-504	OPT 221-4543-508
15	221-4543-504	OPT 221-4543-508
16	221-4543-504	OPT 221-4543-508

(Counting From Top to Bottom) RH/T/R 221-0504-603
No. 2 RH Engine Thrust Reverser, RH Side
Reversers: 221-4126-1003, -1015

Table 502 (Sheet 7)

ITEM NO.	PART NUMBER	NOTES
1	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
2	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
3	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
4	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
5	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
6	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
7	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
8	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
9	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
10	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
11	221-0778-549	OPT 221-0778-501, -513, -521, -525, -529, -533, -537, -541, -545
12	221-0778-551	OPT 221-0778-503, -515, -523, -527, -531, -535, -539, -543, -547
13	221-0778-551	OPT 221-0778-503, -515, -523, -527, -531, -535, -539, -543, -547
14	221-4543-508	OPT 221-4543-504
15	221-4543-508	OPT 221-4543-504
16	221-4543-508	OPT 221-4543-504

(Counting From Top to Bottom) RH T/R 221-0504-643
No. 2 RH Engine Thrust Reverser, RH Side
Reversers: 221-4126-1051, -1063, -1075, -1087, -1099, -1111, -1123, -1135, -1147, -1159

Table 502 (Sheet 8)

L-D3030 (0705)

BM5 78 32 12 5 KEMD 00

Thrust Reverser Cascades - Post TRIP
(Sheet 4/4)
Figure 503

R

THRUST REVERSER CASCADES - INSPECTION/CHECK

1. Equipment and Materials

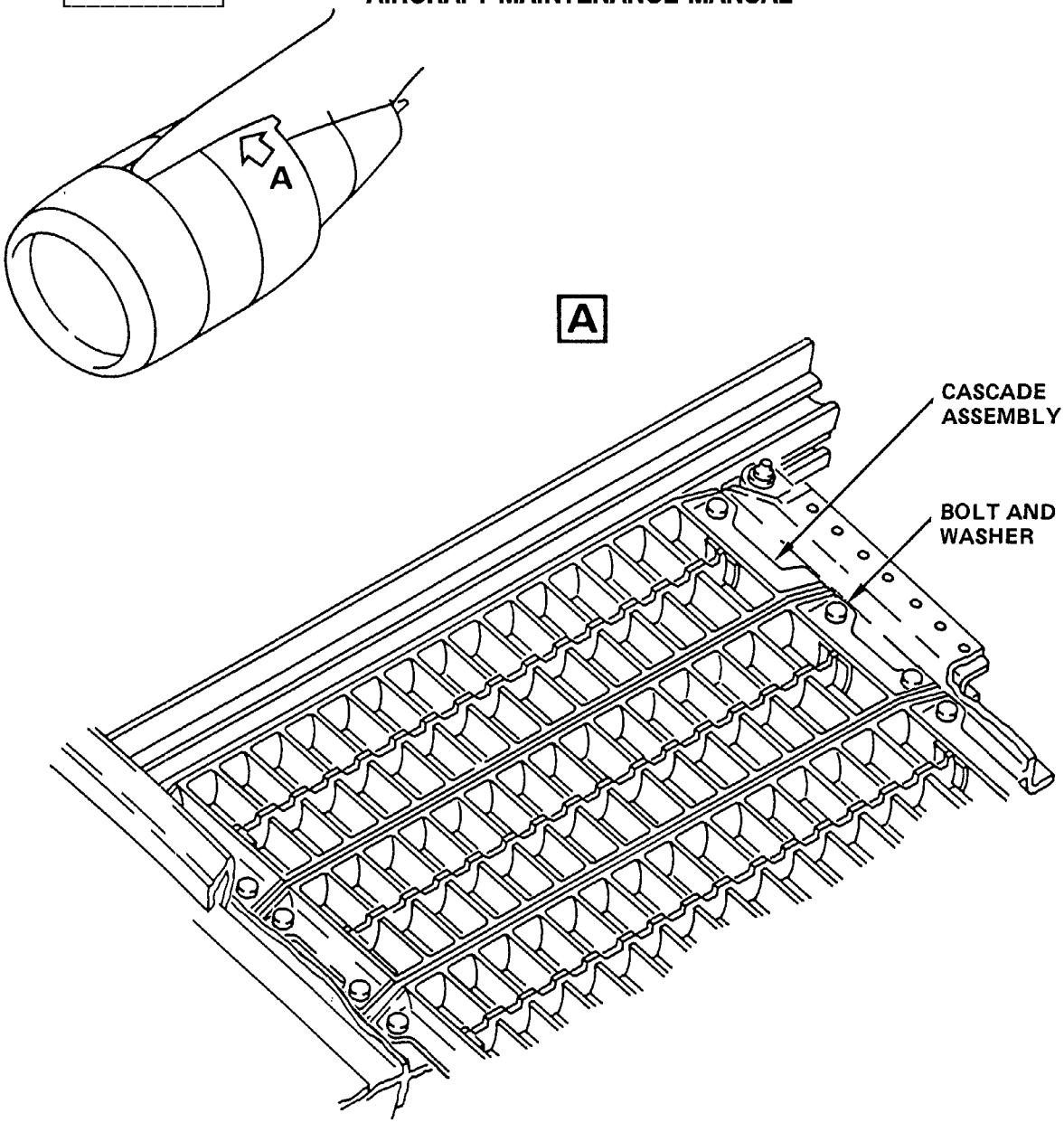
ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breaker safety clips
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-12, P. Block 401	Thrust Reverser Cascades

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform
(3)Manually translate thrust reverser sleeves to deployed position (Ref. 78-32-11, P. Block 201).

B. Inspection/Check (Ref. Fig. 601)
(1)Inspect cascades for cracks and missing vanes.
(2)Replace any defective cascades (Ref. 78-32-12, P. Block 401).
(3)Inspect for missing or loose attach bolts.
(4)Replace missing bolts and washers. TORQUE new bolts and loose bolts to between 50 and 70 lbf.in. (0.56 and 0.79 m.daN).

C. Close-Up
(1)Manually translate thrust reverser sleeves to stowed position (Ref. 78-32-11, P. Block 201).
(2)Remove access platform
(3)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



L—A391R

BM5 78 32 12 6 KAMO - 00/30 - 00/25
DM5

Thrust Reverser Cascades
Figure 601

THRUST REVERSER BLOCKER DOORS - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
C. Material No.P03-001	Oils (Ref. 70-00-00)
D. Material No.P05-017	Special Materials (Ref. 70-00-00)
E. Material No.P09-002	Sealants (Ref. 70-00-00)
F. Material No.P11-005	Cleaning Agents (Ref. 70-00-00)
G. Material No.P11-043	Cleaning Agents (Ref. 70-00-00)
H. RSE1136	Tension Tool
R J.	Push-Pull Gage (Model LG-100 or Equivalent)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves
- 78-32-13, P. Block 601	Thrust Reverser Blocker Doors

2. Procedure

A. Job Set-Up
(1)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.

B. Removal (Ref. Fig. 401)
(1)Partially deploy thrust reverser translating sleeves. (Ref. 78-32-11, P. Block 201).
(2)Remove the nut (2), washers (3), bushings (4) and bolt (5), that attach link assembly (1) to blocker door (16). Discard the nut.
NOTE : For alternate spring link configuration, remove nut (6) and bolt (7) that attach link assembly (30) to blocker door (16). Discard the nut.
(3)Remove nuts (8), washers (9) and (10), bushings (11), (13) and (14), and bolts (12) and (15) that attach the blocker door to translating sleeve and remove blocker door (16).
(4)Remove collars (17) and Hi-Lok pins (18) and (19) that attach the blocker door link bracket (20) and shims (21) to inner barrel.
(5)If necessary for part replacement, remove cotter pin (22), nut (23), washers (24) and (27), bushings (25) and (28), bolt (26) and shoe (29) from blocker door spring link. Discard the nut and cotter pin.

C. Installation (Ref. Fig. 401, 402)
WARNING : SOLVENTS (MATERIALS No. P11-005 AND P11-043) ARE FLAMMABLE AND VAPOR IS HARMFUL. USE IN A WELL VENTILATED AREA. AVOID PROLONGED BREATHING OF VAPOR AND PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE IRRITATION OF EYES, NOSE, THROAT AND SKIN. HIGH CONCENTRATIONS MAY CAUSE IMPAIRED JUDGEMENT.

PROTECTIVE GLOVES SHOULD BE WORN DURING USE. THIS MAY CAUSE DERMATITIS BY REMOVING SKIN OILS. BEFORE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(1)If spring link hardware is removed, do as follows :

NOTE : Spring link hardware is not used on the configuration that uses nut (6) and bolt (7).

DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(a)Clean threads of bolt (26) and new nut (23) with solvent (Material No. P11-005 or P11-043). Remove solvent before it evaporates with a wipe (Material No. P05-017).

WARNING : LOCTITE 242 IS A MILD SKIN AND EYE IRRITANT. USE PROPER PERSONAL PROTECTIVE EQUIPMENT TO AVOID CONTACT. BEFORE USE OF THIS PRODUCT CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(b)Install bushings (28) in shoe (29). Install washers (27), bolt (26), washers (24), bushings (25) and nut (23) with compound (Material No. P09-002). TORQUE the nut to between 100 and 140 lbf.in. (1.13 and 1.58 m.daN). Install cotter pin (22).

(2)Install blocker door on translating sleeve.

(a)Lubricate bolts (12) and (15) threads with engine oil (Material No. P03-001).

(b)Install thrust reverser blocker door on translating sleeve and attach with bolts (12) and (15), bushings (11), (13) and (14), washers (9) and (10) and nuts (8). TORQUE the nut to between 50 and 70 lbf.in. (0.56 and 0.79 m.daN).

WARNING : SOLVENTS (MATERIALS No. P11-005 AND P11-043) ARE FLAMMABLE AND VAPOR IS HARMFUL. USE IN A WELL VENTILATED AREA. AVOID PROLONGED BREATHING OF VAPOR AND PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE IRRITATION OF EYES, NOSE, THROAT AND SKIN. HIGH CONCENTRATIONS MAY CAUSE IMPAIRED JUDGEMENT. PROTECTIVE GLOVES SHOULD BE WORN DURING USE. THIS MAY CAUSE DERMATITIS BY REMOVING SKIN OILS. BEFORE USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(3)Attach blocker door link assembly to blocker door.

(a)Clean threads of bolt (5) or (7) and nut (2) or (6) with solvent (Material No. P11-005 or P11-043). Remove solvent before it evaporates with a wipe (Material No. P05-017).

WARNING : LOCTITE 242 IS A MILD SKIN AND EYE IRRITANT. USE PROPER PERSONAL PROTECTIVE EQUIPMENT TO AVOID CONTACT. BEFORE USE OF THIS PRODUCT CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(b)Attach link assembly (1) with bolt (5), washers (3), bushings (4) and wet install new nut (2) with locking compound, grade 242 (Material No. P09-002). Make sure off-center side of the link

faces forward.

NOTE : For alternate spring link configuration, attach link
R assembly (30) to blocker door with bolt (7) and new nut (6). Use locking compound grade 242 (Material No. P09-002) to wet install the new nut.

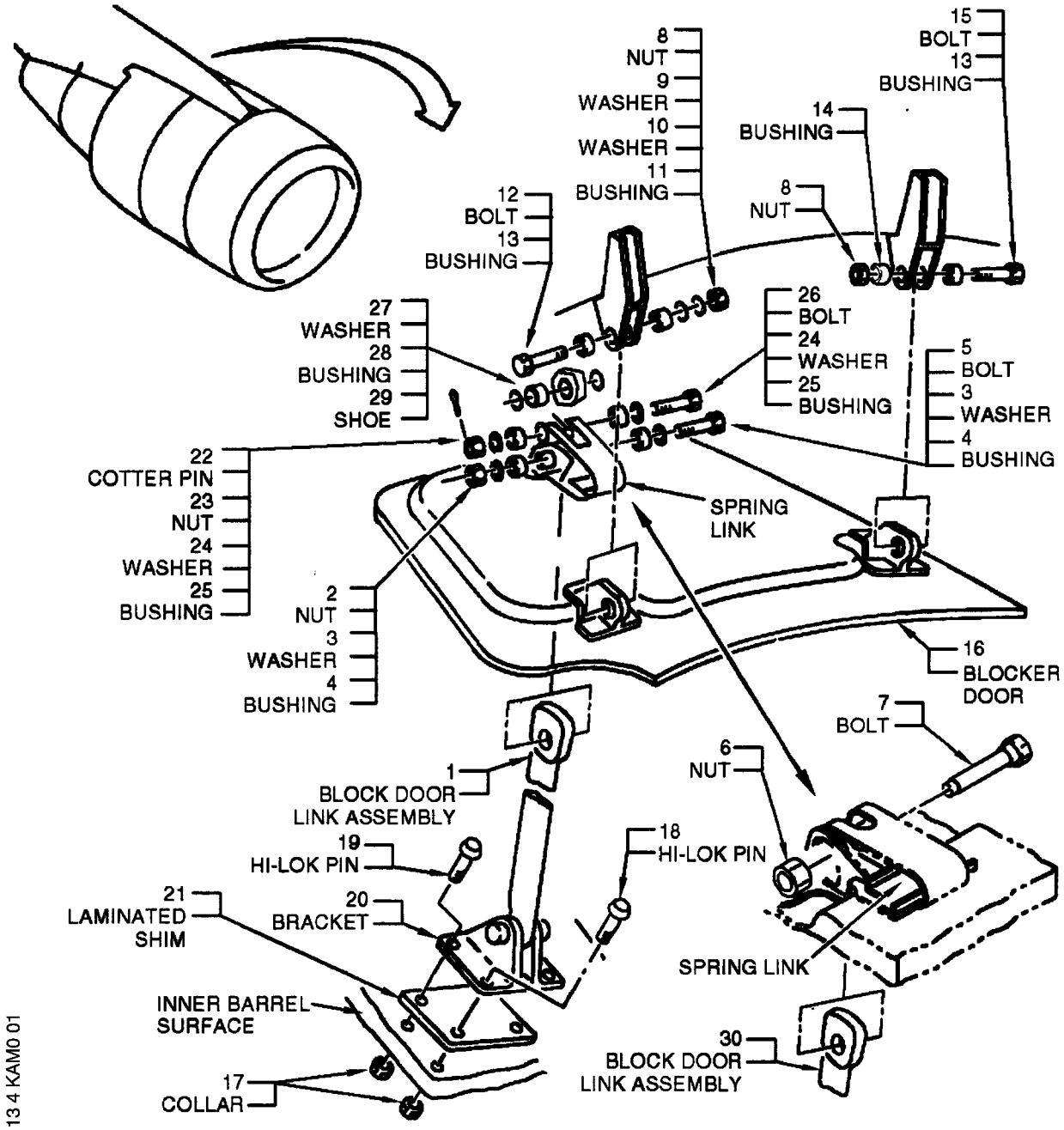
NOTE : Attachment hardware is not interchangeable.

(c)TORQUE nut (2) to between 100 and 140 lbf.in. (1.13 and 1.58 m.daN).
TORQUE nut (6) to between 160 and 190 lbf.in. (1.81 and 2.15 m.daN).

(4)Manually stow translating sleeves (Ref. 78-32-11, P. Block 201).
(5)Place RSE1136 tension tool on thrust reverser inner barrel
(6)Place lever of tension tool under blocker door link assembly.
(7)Place push-pull gage on platform of tension tool.
(8)Apply force to between 15 and 25 lbf (6.67 and 11.12 daN) to platform of tension tool. Measure gap between inner barrel surface and blocker door link bracket.
(9)Remove tension tool.
(10)Place laminated shim (21), which is the same thickness as the gap measured in step (8), between inner barrel surface and blocker door link bracket (20).
(11)Install Hi-Lok pins (18), (19), collars (17) attaching blocker door link bracket (20) and laminated shim (21) to inner barrel.
(12)Measure the gap between the blocker doors and the C-duct inner barrel outer skin of the thrust reverser to meet gap requirements (Ref. 78-32-13, P. Block 601).

D. Test
(1)Perform operational test (Ref. 78-32-11, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Remove access platform.
(3)Close fan cowl doors. Remove safety clips and tags and close circuit breakers. (Ref. 71-13-00, P. Block 301).



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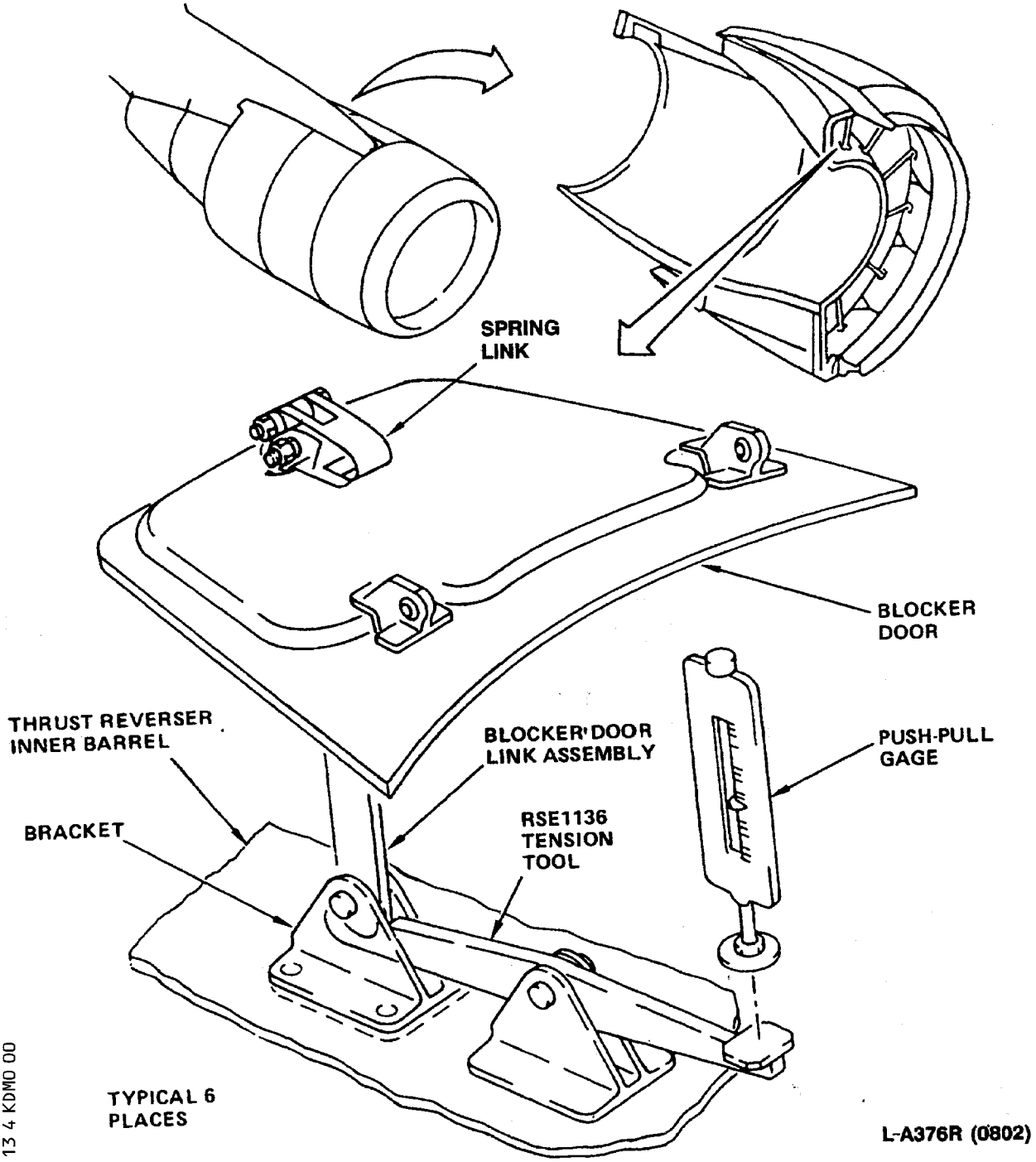
PW C

R Thrust Reverser Blocker Doors
Figure 401



Thrust Reverser Blocker Doors
Figure 402

R

THRUST REVERSER BLOCKER DOORS - INSPECTION/CHECK

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
R - 78-32-13, P. Block 801	Thrust Reverser Blocker Doors

2. Procedure

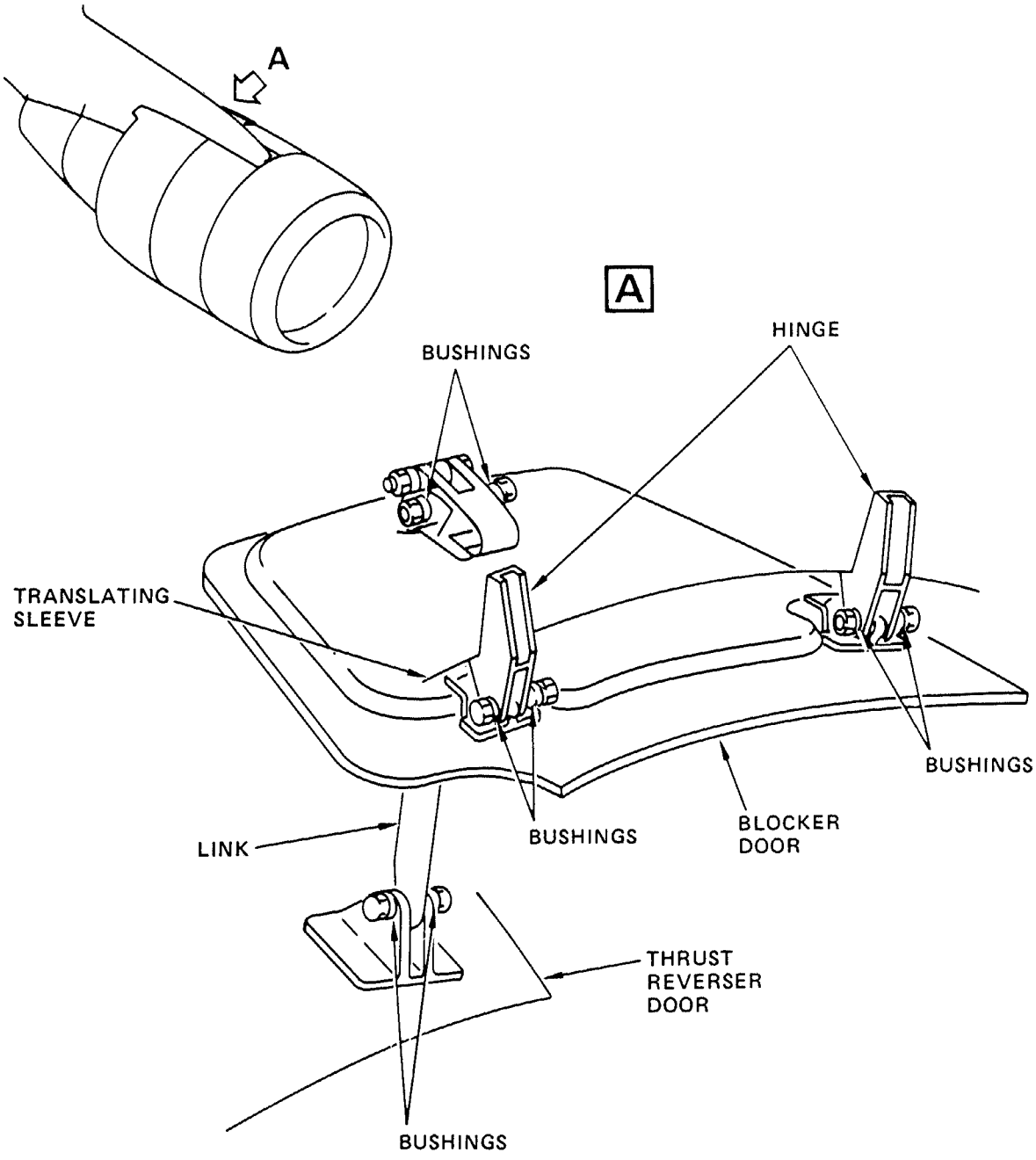
A. Job Set-Up
(1)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.

B. Inspect Thrust Reverser Blocker Doors (Ref. Fig. 601)
CAUTION : THRUST REVERSER DOORS MUST BE CLOSED AND LATCHED BEFORE OPERATION OF ANY THRUST REVERSER SYSTEM.
(1)With translating sleeve in stowed position, check each blocker door for signs of poor fit, cracks, dents, wear.
(2)Partially deploy translating sleeve (Ref. 78-32-11, P. Block 201).
(3)Check blocker doors dor dents, cracks, wear, corrosion, loose bolts/ rivets.
(4)Move each blocker door. Check for movement indicating excessive wear of hinge bushings.

C. Close-Up
(1)Remove access platform.
(2)Close and stow translating sleeve (Ref. 78-32-11, P. Block 201).
(3)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

3. Thrust Reverser Blocker Doors Inspection

A. General
(1)This procedure provides gap check for the blocker doors to prevent wear damage on the C-duct inner barrel outer skin of the thrust reverser.
R (2)Trim the blocker door as necessary (Ref. 78-32-13, P. Block 801).
B. Procedure (Ref. Fig. 602, 603, 604)
(1)Job Set-Up
(a)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(b)Install access platform.
(c)Gain access to blocker door in stow position.
(2)Translating sleeves in stowed position.



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Thrust Reverser Blockers Doors
Figure 601

(a)With translating sleeve in stowed position, measure the gap between the blocker doors and the island fairings. Make certain that the gap measurement of dimension A to dimension F is between 0.060 in. and 0.120 in. (1.52 and 3.05 mm) (Ref. Fig. 602).
(b)If the measurement does not meet the gap requirements, mention it on any of the blocker doors that are not to the gap limits.
(c)Trim the blocker doors to the required limits (Ref. 78-32-13, P. Block 801).

(3)Deploy translating sleeves (Ref. 78-32-11, P. Block 201).
(a)With translating sleeve in the deployed position :
1 Measure the gap between the inner barrel surface and the blocker door link bracket. The minimum clearance required is 0.050 in. (1.27 mm) (Ref. Fig. 603).
2 Measure the gap between each of the blocker doors. The minimum clearance required is 0.050 in. (1.27 mm) (Ref. Fig. 604).
(b)Trim if required (Ref. 78-32-13, P. Block 801).

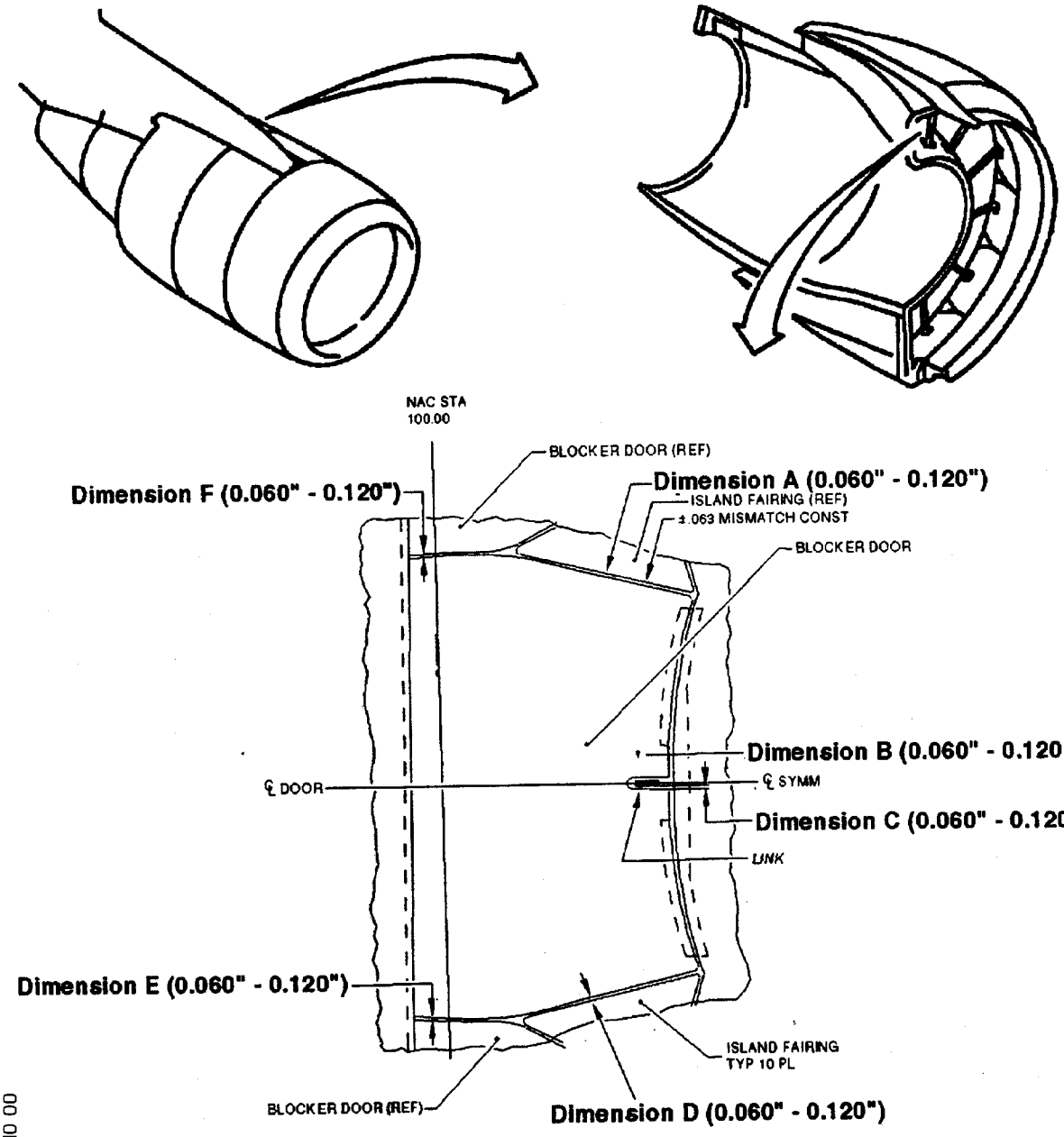
(4)Close-Up
(a)Remove access platform.
(b)Close and stow translating sleeve (Ref. 78-32-11, P. Block 201).
(c)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

4. Inspect Thrust Reverser Blocker Doors - Silicon Rubber Seal

A. General
(1)This procedure checks for wear damage on the silicon rubber seal on the forward edge of the blocker door.

B. Procedure (Ref. Fig. 605)
(1)Job Set-Up
(a)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(b)Install access platform.
(c)Gain access to blocker door in stow position.

(2)Translating sleeves in stowed position.
(a)With translating sleeve in stowed position, visually inspect for damage to the Teflon exterior covering of the silicon rubber seal.
(b)If any amount of damage or delamination to the Teflon exterior of the seal is found, remove the damage or delamination at the next maintenance opportunity.
(c)Inspect the seal with damaged, delaminated or missing Teflon exterior every 180 dats for the following :
1 Visually inspect for cracks or porosity on the silicon rubber seal surface when bent or when in the normal (stowed) position. No cracks or porosity are allowed.
2 Visually inspect for exposed reinforced Dacron fibers. No exposed fibers are allowed.
3 Visually inspect that the seal leading edge is flush with C-duct surface when the blocker door is in the stowed position. No gaps are allowed.
4 Make sure the blocker door is in the stowed position.



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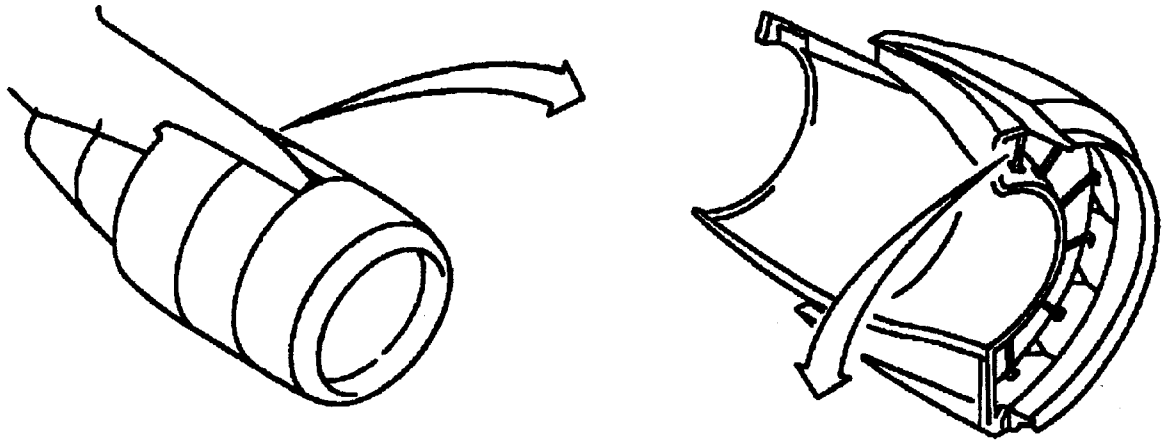
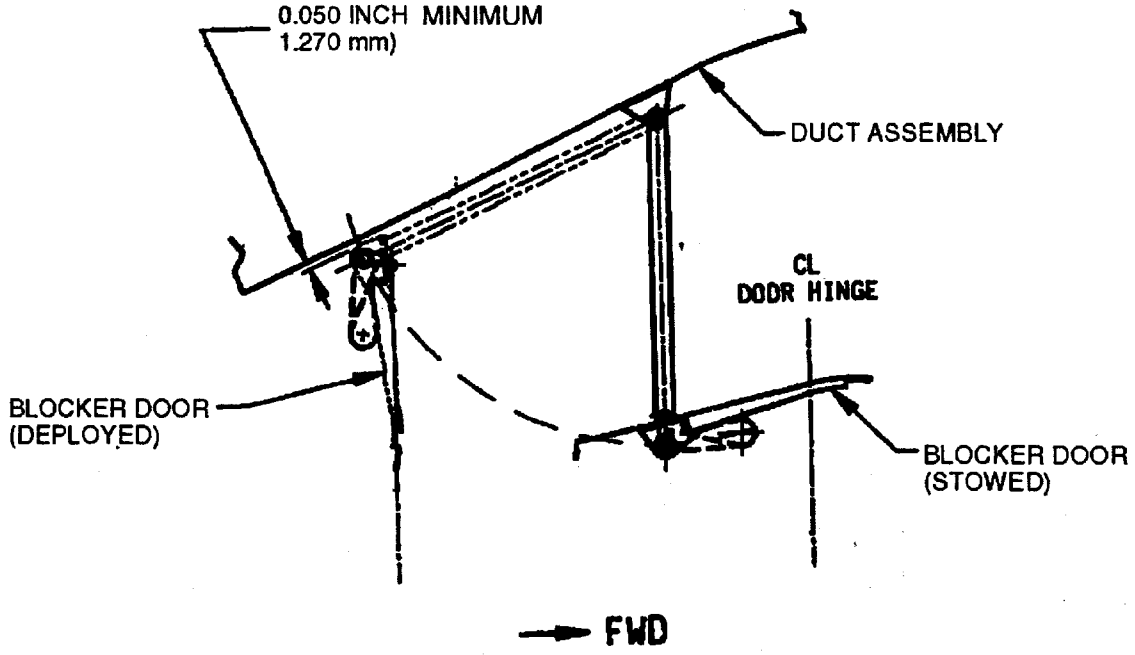
Thrust Reverser Blocker Doors - Stowed Position
Figure 602

R





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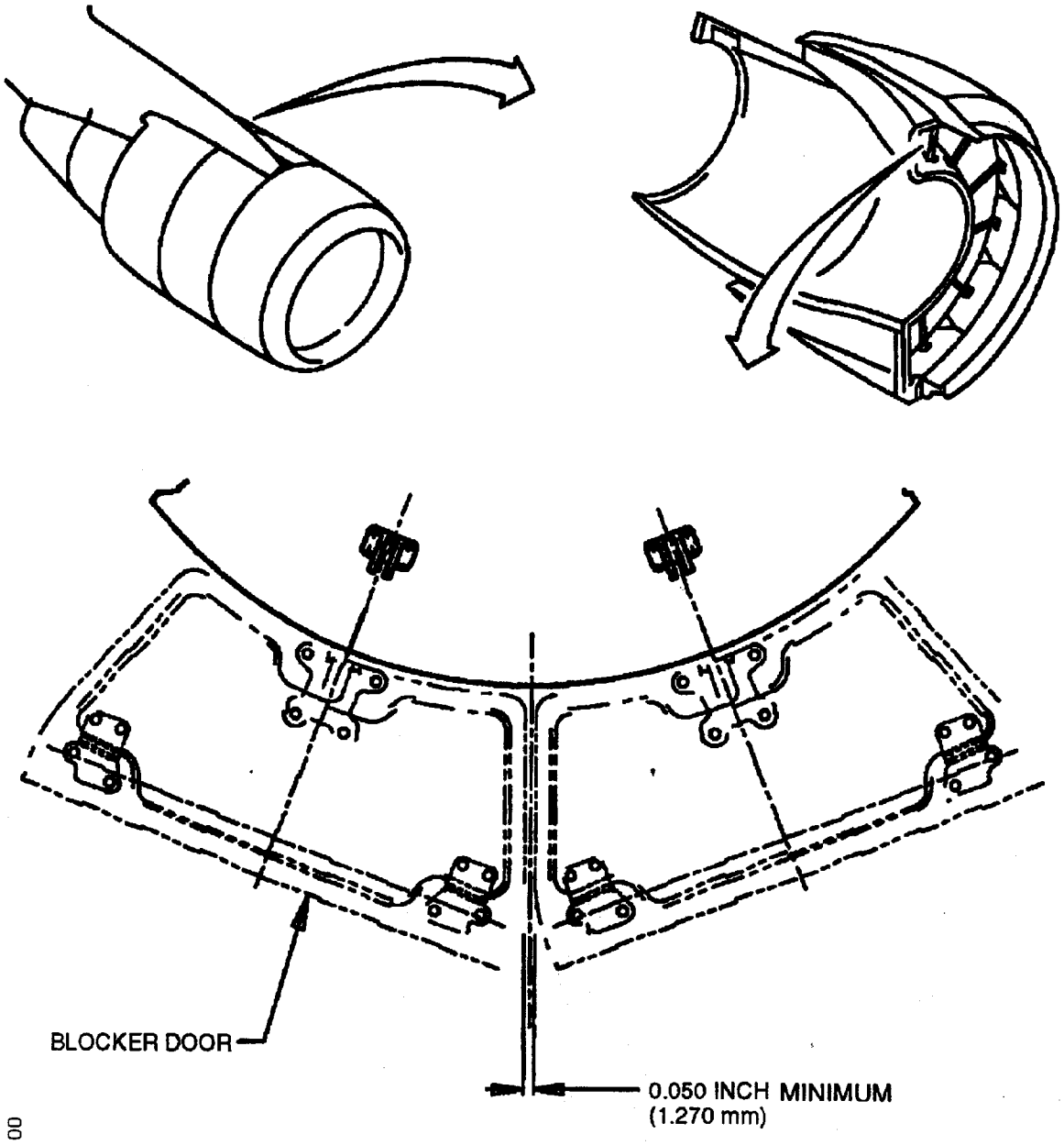
Thrust Reverser Blocker Doors - Deployed Position
Figure 603

R



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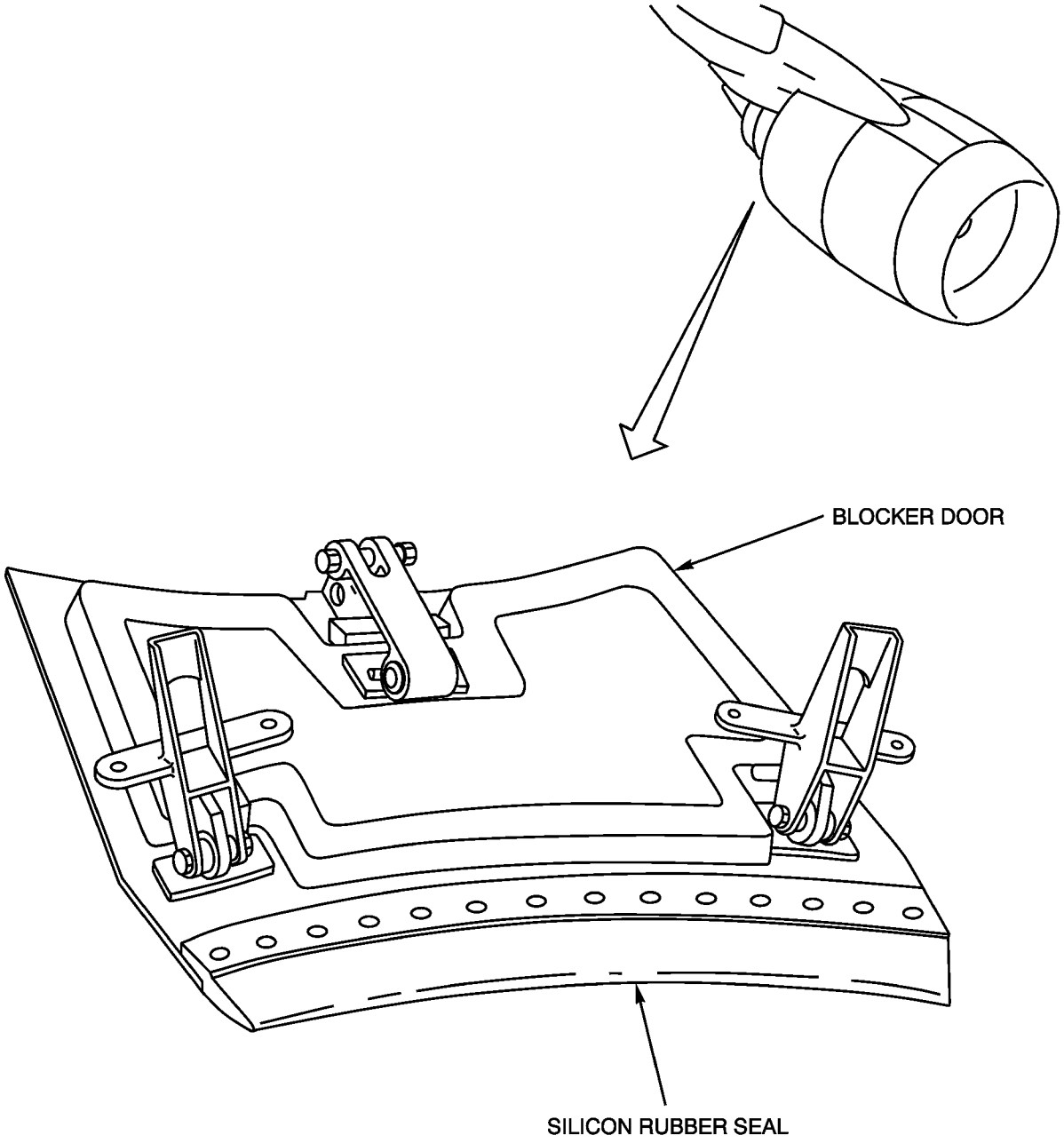
Thrust Reverser Blocker Doors - Deployed Position
Figure 604

R

R Apply finger pressure from under the leading edge of the seal toward
R the engine centerline. Distance of more than 1.0 in. (25.4 mm)
R of the seals leading edge from the C-duct surface is not allowed.
R (d)Replace the blocker door if the seal damage is more than the allowable
R limits (Ref. 78-32-13, P. Block 401).
R (3)Close-Up
R (a)Remove access platform.
R (b)Close fan cowl doors. Remove safety clips and tags and close circuit
R breakers (Ref. 71-13-00, P. Block 301).



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PW V

Thrust Reverser Blocker Doors - Silicon Rubber Seal
Figure 605

R

1. Trim Thrust Reverser Blocker Doors

A. General

(1)This procedure provides instructions to trim blocker doors that did not meet gap requirements.

NOTE : (Ref. 78-32-13, P. Block 601) for gap limits.

B. Prerequisites

(1)Access to the blocker door is through the thrust reverser doors. (Ref. 71-13-00, P. Block 301) for thrust reverser door opening and closing procedures.

(2)Remove the blocker door(s) that do not meet the gap requirements (Ref. 78-32-13, P. Block 401).

C. Equipment and Materials

ITEM	DESIGNATION
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-13, P. Block 401	Thrust Reverser Blocker Doors
- 78-32-13, P. Block 601	Thrust Reverser Blocker Doors

D. Procedure

NOTE : Make certain that all blocker doors on the specific thrust reverser half have been installed by the applicable maintenance manual.

(1)Trim blocker door.

(a)Use the best shop practice to trim the blocker door that does not meet the gap requirements at the interference location. Trim an equal amount off each blocker door to obtain the minimum clearance.

(b)Do not trim the blocker door more than 0.100 in. (2.540 mm) on the existing contour.

NOTE : Trim of the blocker door is required to make sure the fit is correct.

NOTE : Make sure the radius is smooth. No sharp edges are allowed. It is permitted to trim around the blocker door to meet the required gap with the same limitations.

(c)If the blocker door is trimmed to meet gap requirements in deployed position, do as follows :

1 When the blocker door repair is completed, do the following :

- Stow the translating sleeves (Ref. 78-32-11, P. Block 201).
- Check gap measurements of the blocker doors (Ref. 78-32-13, P. Block 601).
- Trim door as applicable.

(2)Finish trimmed blocker door as shown in SRM.

BLOCKER DOOR LINK ASSEMBLY - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
C. Material No.P05-017	Special Materials (Ref. 70-00-00)
D. Material No.P06-003	Antigalling Compound (Ref. 70-00-00)
E. Material No.P09-002	Sealants (Ref. 70-00-00)
F. Material No.P11-005	Cleaning Agents (Ref. 70-00-00)
G. Material No.P11-043	Cleaning Agents (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves

2. Procedure

A. Job Set-Up
(1)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Partially translate thrust reverser sleeves to deploy (extend) position (Ref. 78-32-11, P. Block 201).
(3)Install access platform.

B. Removal (Ref. Fig. 401)
(1)Remove bolts (7) and bushing (4) attaching link assembly to bracket on inner barrel of thrust reverser door.
R (2)Remove nut (2), bolt (6), washers (5) and bushings (3) attaching link (1) to blocker door and remove link. Discard nut.
NOTE : On alternate spring link configuration, remove nut (8) and bolt
R (9) attaching link assembly (10) to blocker door and remove link. Discard nut.

C. Installation (Ref. Fig. 401)
(1)Attach blocker door link assembly (1) to blocker door as follows :
WARNING : SOLVENT (MATERIAL NO.P11-005 AND P11-043) IS FLAMMABLE AND VAPOR IS HARMFUL. USE IN A WELL VENTILATED AREA. AVOID BREATHING THE VAPOR FOR LONG PERIODS TIME. LONG OR REPEATED CONTACT CAN CAUSE IRRITATION OF EYES, NOSE, THROAT AND SKIN. HIGH CONCENTRATIONS MAY CAUSE IMPAIRED JUDGEMENT. PROTECTIVE GLOVES SHOULD BE WORN DURING USE. SOLVENTS MAY CAUSE A SKIN RASH BY REMOVING SKIN OILS. BEFORE USING THESE PRODUCTS, CAREFULLY READ THE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.
(a)Clean the threads of bolts (6), (9) and nuts (2), (8) with Solvent (Material No.P11-005 or P11-043). Remove solvent before it evaporates with a Cotton Wiper (Material No.P05-017).
WARNING : THREAD LOCKING COMPOUND (MATERIAL NO.P09-002) IS A MILD SKIN

AND EYE IRRITANT. USE PROPER PERSONAL PROTECTIVE EQUIPMENT TO AVOID CONTACT. BEFORE USING THIS PRODUCT, CAREFULLY READ THE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(b)Attach link assembly (1) with bolt (6), washers (5), bushings (3) and wet install a new nut (2) using Locking Compound, Grade 242 (Material No.P09-002). Make sure the off-center side of the link faces forward.

NOTE : On alternate spring link configuration, attach link assembly

R (10) to blocker door with bolt (9) and a new nut (8). Use Locking Compound, Grade 242 (Material No.P09-002) to wet install a new nut.

NOTE : Attached hardware is not interchangeable.

(c)TORQUE nut (2) to between 100 and 140 lbf.in. (1.13 and 1.58 m.daN). TORQUE nut (8) to between 160 and 190 lbf.in. (1.81 and 2.14 m.daN).

(2)Apply Antigalling Compound (Material No.P06-003), to threads of bolts (7).

(3)Attach link end and bushing (4) to pivot bracket on inner barrel with bolts (7). TORQUE bolts to between 12 and 15 lbf. in. (0.136 and 0.169 m.daN).

(4)Manually stow translating sleeves. (Ref. 78-32-11, P. Block 201).

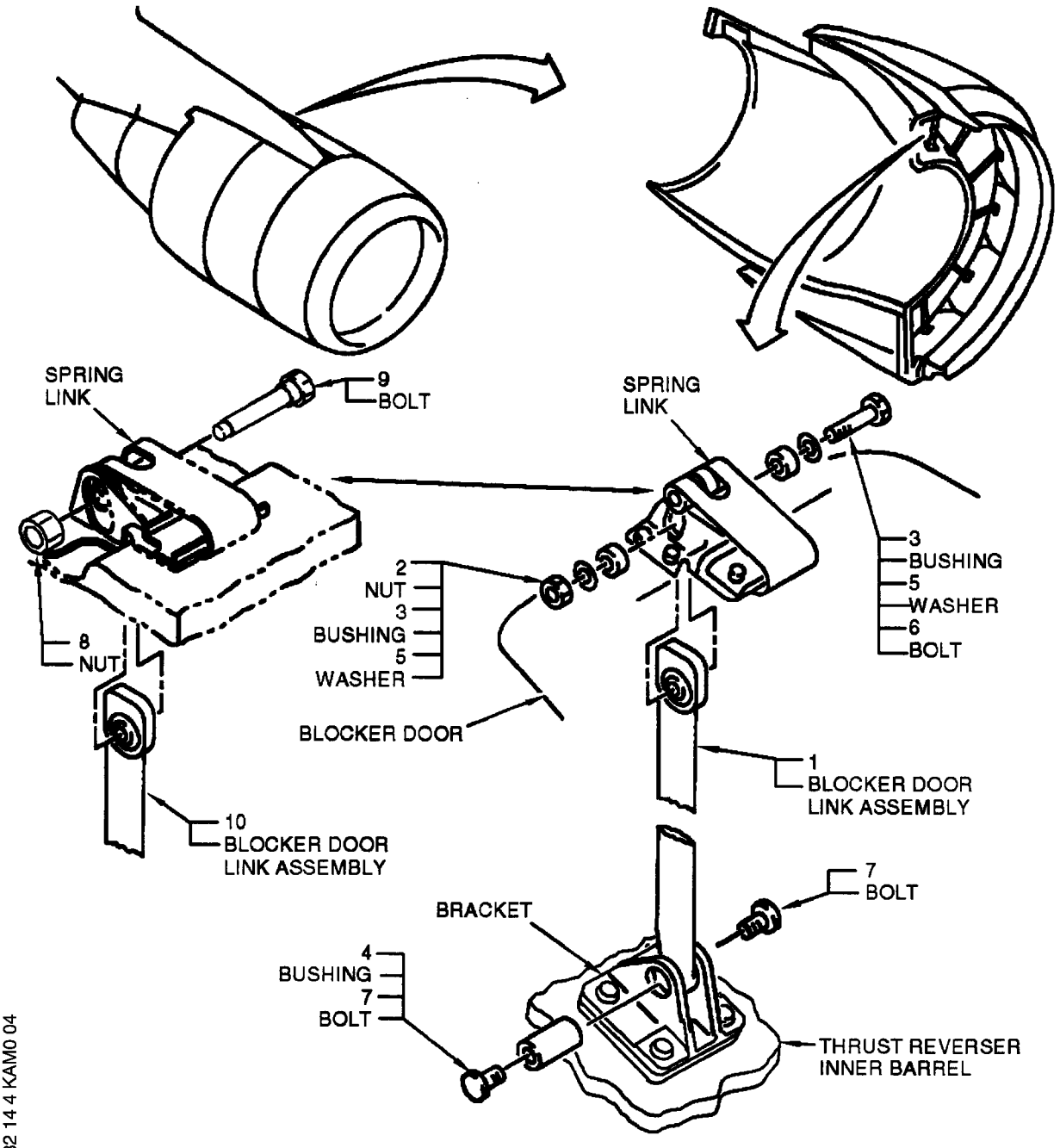
D. Test

(1)Perform operational test (Ref. 78-32-11, P. Block 501).

E. Close-Up

(1)Remove access platform.

(2)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



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PW C

R Blocker Door Link Assembly
Figure 401

BLOCKER DOOR LINK ASSEMBLY - INSPECTION/CHECK

1. Equipment and Material

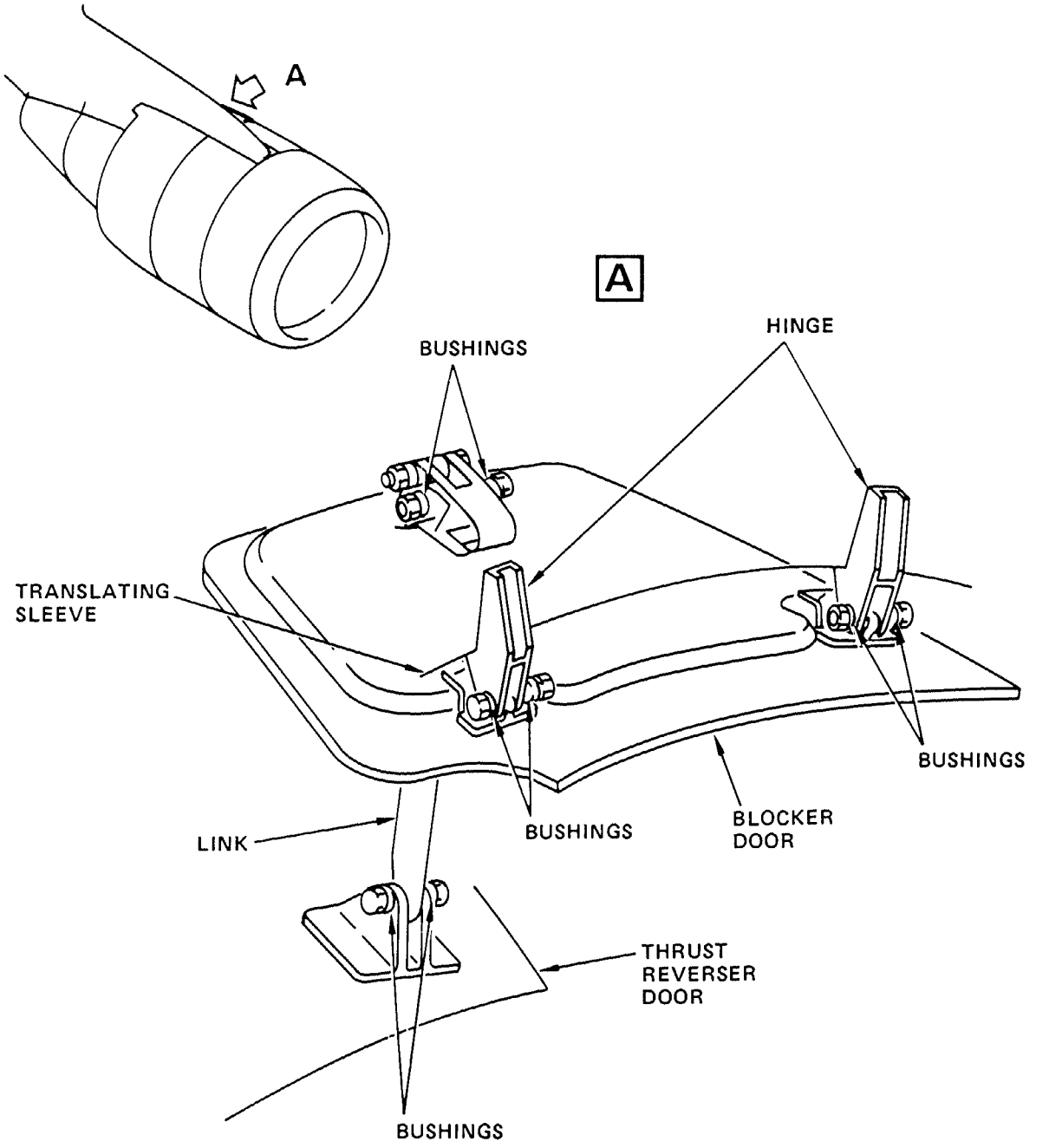
ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves

2. Procedure

A. Job Set-Up
(1)Open, safety and tag circuit breakers for the appropriate engine.
(2)Install access platform.

B. Inspect Blocker Door Link Assembly (Ref. Fig. 601)
CAUTION : THRUST REVERSER DOORS MUST BE CLOSED AND LATCHED BEFORE OPERATION OF ANY THRUST REVERSER SYSTEM.
(1)With translating sleeve in stowed position, check each blocker door for signs of poor fit, cracks, dents, wear.
(2)Partially deploy translating sleeve (Ref. 78-32-11, P. Block 201).
(3)Check blocker door links for bending, dents, cracks, wear, corrosion, loose bolts/rivets.
(4)Move each blocker link. Check for movement indicating excessive wear of link bushings.

C. Close-Up
(1)Remove access platform.
(2)Close and stow translating sleeve (Ref. 78-32-11, P. Block 201).
(3)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



Blocker Door Link Assembly
Figure 601

THRUST REVERSER CASCADE SUPPORT FRAME ASSEMBLY - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
C.	Lint-Free Cloth
D. Material No.P05-127	Special Materials (Ref. 70-00-00)
E. Material No.P09-013	Sealants (Ref. 70-00-00)
F. Material No.P11-043	Cleaning Agents (Ref. 70-00-00)
G. Material No.P18-016	Extinguishing Agents (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Thrust Reverser Translating Sleeves
- 78-32-11, P. Block 501	Thrust Reverser Translating Sleeves
- 78-32-12, P. Block 401	Cascades - Thrust Reverser

2. Aft Support Frame Assembly of the Thrust Reverser Cascades

A. Job Set-Up

(1)Open, safety and tag the appropriate circuit breakers and open applicable fan cowl doors to the full open position (Ref. 71-13-00, P. Block 301)

(2)Manually translate the thrust reverser sleeves to the deployed position (Ref. 78-32-11, P. Block 201).

(3)Install access platform.

B. Removal (Ref. Fig. 401, 402)

(1)Remove the cascade assemblies (Ref. 78-32-12, P. Block 401).

(2)Remove the pins (1), washers (2) and nuts (3) that attach the aft cascade support frame assembly to the translating sleeve track lugs. Remove the aft cascade support frame assembly (4) and place on a suitable workbench. Discard the washers. (Ref. Fig. 401) (Sheet 1/2)

(3)Make a visual inspection of the translating sleeve track lug for bearing wear and damage. If wear or damage is found, replace the bearing (Ref. CMM).

(4)If the aft cascade support frame will be replaced, remove the rivets (1), pads (2), plates (3) and shims (4). Retain parts if no wear is observed. (Ref. Fig. 402)

C. Installation (Ref. Fig. 401, 402, 403)
(Ref. Fig. 404)

CAUTION : THRUST REVERSER MUST BE INSTALLED ON AIRCRAFT AND MUST BE FULLY RIGGED AND LATCHED. YOU CANNOT PROPERLY RIG THE AFT CASCADE SUPPORT FRAME ASSEMBLY IF THESE CONDITIONS ARE NOT PRESENT.

CAUTION : FAILURE TO FOLLOW THE CASCADE SUPPORT FRAME ASSEMBLY INSTRUCTIONS PROPERLY (GAP RIGGING) CAN RESULT IN POSSIBLE STRUCTURAL DAMAGE.

(1)Position and loosely install the aft cascade support frame assembly on the thrust reverser half. Use two pins (1), four washers (2) and two nuts (3). Make sure the gap between the washers and bearing face is less

than 0.005 inch (0.13 mm). TORQUE the nuts to between 100 and 140 lbf.in (1.13 and 1.58 m.daN). (Ref. Fig. 401)

NOTE : Washers (2) can be added or removed to get the maximum 0.005 inch (0.13 mm) gap.

NOTE : The following steps are to prepare and adjust a new aft cascade support frame assembly. If an old cascade support frame assembly, with pads, is to be installed, proceed to step 2.C.(17).

(2)Loosely install all 16 cascades onto the thrust reverser half with screws and washers (Ref. 78-32-12, P. Block 401).

CAUTION : MAKE SURE THE TRANSLATING SLEEVE IS IN THE FULLY DEPLOYED POSITION AND THE THRUST REVERSER IS LATCHED BEFORE YOU TAKE THE GAP MEASUREMENTS BETWEEN THE AFT CASCADE SUPPORT FRAME AND THE TRANSLATING SLEEVE INNER PANEL. IF THESE CONDITIONS ARE NOT PRESENT, THE GAP DISTANCE COULD BE INCORRECT.

CAUTION : DO NOT EXCEED THE MAXIMUM TORQUE VALUE SPECIFIED OR PART DAMAGE CAN OCCUR.

(3)Torque the attaching bolts for cascade No. 1 to the torque value (Ref. 78-32-12, P. Block 401).

NOTE : Cascade No. 1 is at the top location. (Ref. Fig. 403)

(4)Do step 2.C.(3) for cascades No. 2 through No. 16.

NOTE : Cascades must be installed in the sequence in step 2.C.(4) to achieve repeatability of the gap measurements.

(5)Remove cascade No. 4. Measure and record the gap between the ramp on translating sleeve inner panel and the aft cascade support frame assembly. (Ref. Fig. 402, 403)

NOTE : Remove only one cascade at a time when taking gap measurements.

NOTE : Measure the gap either from the bumper pads or the location where the bumper pads will be installed.

(6)Loosely install cascade No. 4, then torque the attaching bolts to the torque value (Ref. 78-32-12, P. Block 401).

(7)Do steps 2.C.(5) and 2.C.(6) for cascade No. 6.

(8)Do steps 2.C.(5) and 2.C.(6) for cascade No. 9.

(9)Do steps 2.C.(5) and 2.C.(6) for cascade No. 12.

(10)Do steps 2.C.(5) and 2.C.(6) for cascade No. 15.

R (11)Remove the cascade assemblies (Ref. 78-32-12, P. Block 401).

R (12)Remove the pins (1), washers (2) and nuts (3) that attach the aft cascade support frame assembly to the translating sleeve track lugs. Remove the aft cascade support frame assembly and place it on a suitable workbench. Retain all hardware. (Ref. Fig. 401) (Sheet 1/2)

R (13)Review the measurements of the gaps between the ramps on the translating sleeve inner panel and the pad locations.

R If the gaps are at least 0.061 in. (1.55 mm), proceed to Step 2.C.(14).

R If a gap is less than 0.061 in. (1.55 mm), do the steps that follow at that location :

R (a)If the gap is between 0.040 and 0.060 in. (1.02 and 1.52 mm), remove material from the pad as follows :

R 1 Remove a maximum of 0.020 in. (0.51 mm) of material from the chamfered side of the pad that will be installed in this location. Make sure that the pad keeps a minimum thickness of 0.040 in. (1.02 mm) (Ref. Fig. 402).

R 2 Reidentify the modified pad as part number 221M5018-5 with

R Independent Ink No. 73 or equivalent.
R (b)If the gap is less than 0.040 in. (1.02 mm), remove material from the
R ramp on the thrust reverser sleeve as follows :
R 1 Remove the rivets (1) and (2) that attach the ramp (3) to the
R thrust reverser sleeve inner panel. Discard the rivets
R (Ref. Fig. 404).
R CAUTION : THE RAMP WEAR SURFACE MUST REMAIN INTACT. DO NOT REMOVE
R MATERIAL FROM THE WEAR SURFACE.
R 2 Remove up to 0.060 in. (1.524 mm) of material from the bottom
R of the ramp surface.
R WARNING : METHYL ISOBUTYL KETONE (MIBK) (MATERIAL No. P11-043)
R IS FLAMMABLE AND VAPOR IS HARMFUL. USE IN A WELL
R VENTILATED AREA. AVOID PROLONGED BREATHING OF VAPOR OR
R PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE
R IRRITATION OF EYES, NOSE, THROAT AND SKIN. HIGH CONCEN-
R TRATIONS MAY CAUSE WEAKNESS, HEADACHE, NAUSEA, DIZZINESS
R AND IMPAIRED JUDGMENT. PROTECTIVE GLOVES SHOULD BE WORN
R DURING USE. MAY CAUSE DERMATITIS BY REMOVING SKIN OILS.
R PRIOR TO USE OF THIS PRODUCT, CAREFULLY READ THE
R APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL
R LISTED SAFETY AND HEALTH PRECAUTIONS.
R 3 Clean the reworked surface with a clean cloth moistened with
R Material No. P11-043. Wipe dry before the solvent evaporates.
R WARNING : WHEN YOU USE ALODINE 1200 POWDER (MATERIAL NO.
R P05-127), USE PERSONAL PROTECTIVE EQUIPMENT SUCH AS
R SAFETY GLASSES, GLOVES, ETC. TO PREVENT EXPOSURE.
R ALODINE 1200 IS AN OXIDIZER/CORROSIVE MATERIAL.
R PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE
R "CHROMESORES". LONG TERM EXPOSURE CAN CAUSE LIVER
R DAMAGE, KIDNEY DAMAGE AND DERMATITIS. PROLONGED OR
R REPEATED INHALATION OF MIST MAY CAUSE ULCERATION AND
R PERFORMATION OF NASAL SEPTUM. USE NIOSH-APPROVED
R RESPIRATORY PROTECTION WHERE CONCENTRATIONS EXCEED
R ACCEPTABLE LIMITS AND/OR WHERE VENTILATION CONTROLS ARE
R NEEDED. SWABS OF CLOTH SATURATED WITH SOLUTION CONSTITUTE
R A FIRE HAZARD IF ALLOWED TO DRY. CONTACT WITH COMBUSTIBLE
R MATERIAL MAY CAUSE FIRE. FOLLOW GOOD HYGIENE PRACTICES
R WHEN HANDLING THIS PRODUCT. PRIOR TO USE OF THIS PRODUCT,
R CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA
R SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH
R PRECAUTIONS.
R 4 Apply Material No. P05-127 to the reworked surface with a nylon
R brush or cheesecloth swab. Keep the surface wet with fresh solution
R for two to five minutes. Do not allow the solution to dry on the
R surface.
R 5 Rinse the reworked surface thoroughly with clean water and wipe
R dry. Do not penetrate the Alodine coating.
R WARNING : EPOXY PRIMER (MATERIAL No. P18-016), 10P4-2 BASE
R AND EC117 CATALYST, ARE FLAMABLE AND VAPOR IS HARMFUL.
R AVOID SOURCES OF IGNITION. USE ONLY IN AREAS WITH
R ADEQUATE VENTILATION. WORK PERFORMED IN CONFINED AREAS

R REQUIRES THE USE OF ADDITIONAL FORCED MECHANICAL VENTILA-
R TION. AVOID BREATHING OF VAPOR AND CONTACT WITH SKIN AND
R EYES. MAY CAUSE IRRITATION TO SKIN AND EYES. OVEREXPOSURE
R MAY CAUSE FATIGUE, WEAKNESS, CONFUSION, HEADACHE,
R DIZZINESS, DROWSINESS AND IMPAIRED JUDGMENT.
R USE REGULATORY AGENCY APPROVED RESPIRATORY PROTECTION FOR
R SPRAY APPLICATIONS. THIS PRODUCT CONTAINS LEAD, A
R CUMULATIVE POISON. WASH HANDS WELL BEFORE EATING,
R DRINKING OR SMOKING. PROTECTIVE GLOVES SHOULD BE WORN
R DURING MIXING APPLICATION. PRIOR TO USE OF THIS PRODUCT,
R CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA
R SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH
R PRECAUTIONS.

R 6 Mix Material No. P18-016 in accordance with the manufacturer's
R instructions.
R 7 Apply Material No. P18-016 mixture 0.0005 - 0.0007 in. (0.0127 -
R 0.0158 mm) thick to the reworked surface on the ramp.
R 8 Allow the Material No. P18-016 mixture to dry for two hours at
R room temperature (65°F - 75°F) (19°C - 23°C), or force
R dry for 15 minutes to 140°F - 180°F (60°C - 82°C).
R 9 Secure reworked ramp to translating sleeve.
R At "A" locations (Ref. Fig. 404) (Sheet 1), wet-install two
R rivets (1) and one rivet (2) with Material No. P18-016. Lengths
R of the rivets are determined by the thickness of the reworked
R ramp.
R At "B" locations (Ref. Fig. 404) (Sheet 1), wet-install three
R rivets (2) with Material No. P18-016. Lengths of the rivets are
R determined by the thickness of the reworked ramp.

R (14)Install the bumper pads as follows :
(a)Position the bumper pads (2) on the support frame at the five locations (Ref. Fig. 402). Clamp the pads in place.
NOTE : During bumper pad (2) installation, install shims as necessary. Use any combination of plates (3) and shims (4) as necessary to
R keep a 0.010 to 0.080 in. (0.25 to 2.03 mm) nominal gap between the bumper pad and the ramp of the translating sleeve (Ref. Fig. 402).
(b)With the pads (2) and shims (if required) as a template, mark the hole locations on the support frame. Remove the pads and shims.
(c)Drill four holes, dis. 0.128 to 0.134 inch (3.25 to 3.40 mm) through the aft cascade support frame assembly. Remove burrs from holes.
R (d)Drill countersink holes, dis. 0.176 to 0.185 inch (4.47 to 4.70 mm) by 100 degrees, in the four holes of the new pads (2). Remove the burrs from the holes.
WARNING : METHYL ISOBUTYL KETONE (MIBK) (MATERIAL NO.P11-043) IS FLAMMABLE AND VAPOR IS HARMFUL. USE IN A WELL VENTILATED AREA. AVOID PROLONGED BREATHING OF VAPOR OR PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE IRRITATION OF EYES, NOSE, THROAT AND SKIN. HIGH CONCENTRATIONS MAY CAUSE WEAKNESS, HEADACHE, NAUSEA, DIZZINESS AND IMPAIRED JUDGEMENT. PROTECTIVE GLOVES SHOULD BE WORN DURING USE. MAY CAUSE DERMATITIS BY REMOVING SKIN OILS. PRIOR TO USE OF THIS

PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(e)Clean the aft cascade support frame assembly, shims, plates and pads with a clean cloth moistened with Methyl Isobutyl Ketone (MIBK) (Material No.P11-043). Wipe dry before the solvent evaporates.

WARNING : EPOXY PRIMER (MATERIAL NO.P18-016), 10P4-2 BASE AND EC117 CATALYST ARE FLAMMABLE AND VAPOR IS HARMFUL. AVOID SOURCES OF IGNITION. USE ONLY IN AREAS WITH ADEQUATE VENTILATION. WORK PERFORMED IN CONFINED AREAS REQUIRES THE USE OF ADDITIONAL FORCED MECHANICAL VENTILATION. AVOID BREATHING OF VAPOR AND CONTACT WITH SKIN AND EYES. MAY CAUSE IRRITATION TO SKIN AND EYES. OVEREXPOSURE MAY CAUSE FATIGUE, WEAKNESS, CONFUSION, HEADACHE, DIZZINESS, DROWSINESS AND IMPAIRED JUDGEMENT. USE REGULATORY AGENCY APPROVED RESPIRATORY PROTECTION FOR SPRAY APPLICATIONS. THIS PRODUCT CONTAINS LEAD, A CUMULATIVE POISON. WASH HANDS WELL BEFORE EATING, DRINKING OR SMOKING. PROTECTIVE GLOVES SHOULD BE WORN DURING MIXING APPLICATION. PRIOR TO USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(f)Mix Epoxy Primer (Material No.P18-016) in accordance with the manufacturer's instructions.

(g)Wet-install rivets (1) to attach the pads (2) and shims at the five locations to the aft cascade support frame with Epoxy Primer (Material No.P18-016). Lengths of rivets are determined by the thickness of the pads and shims.

NOTE : Wet-install shims (4) and plates (3) as necessary.

CAUTION : WHEN YOU INSTALL THE AFT CASCADE SUPPORT FRAME ASSEMBLY ONTO THE TRANSLATING SLEEVE TRACK LUG, MAKE SURE THAT THE HEAD OF THE PIN IS INSTALLED ON THE INBOARD SIDE (Ref. Fig. 401). IF THIS IS NOT DONE, THE BOLT CAN DAMAGE THE INNER SURFACE OF THE SLIDER.

R (15)Position and loosely install the aft cascade support frame assembly on the thrust reverser half. Use two pins (1), four washers (2) and two nuts (3). Make sure the gap between the washers and the bearing face on the lug is less than 0.005 inch (0.13 mm). TORQUE nuts to between 100 and 140 lbf.in. (1.13 and 1.58 m.daN) (Ref. Fig. 401).

NOTE : Washers (2) can be added or removed to obtain the 0.005 inch (0.13 mm) gap.

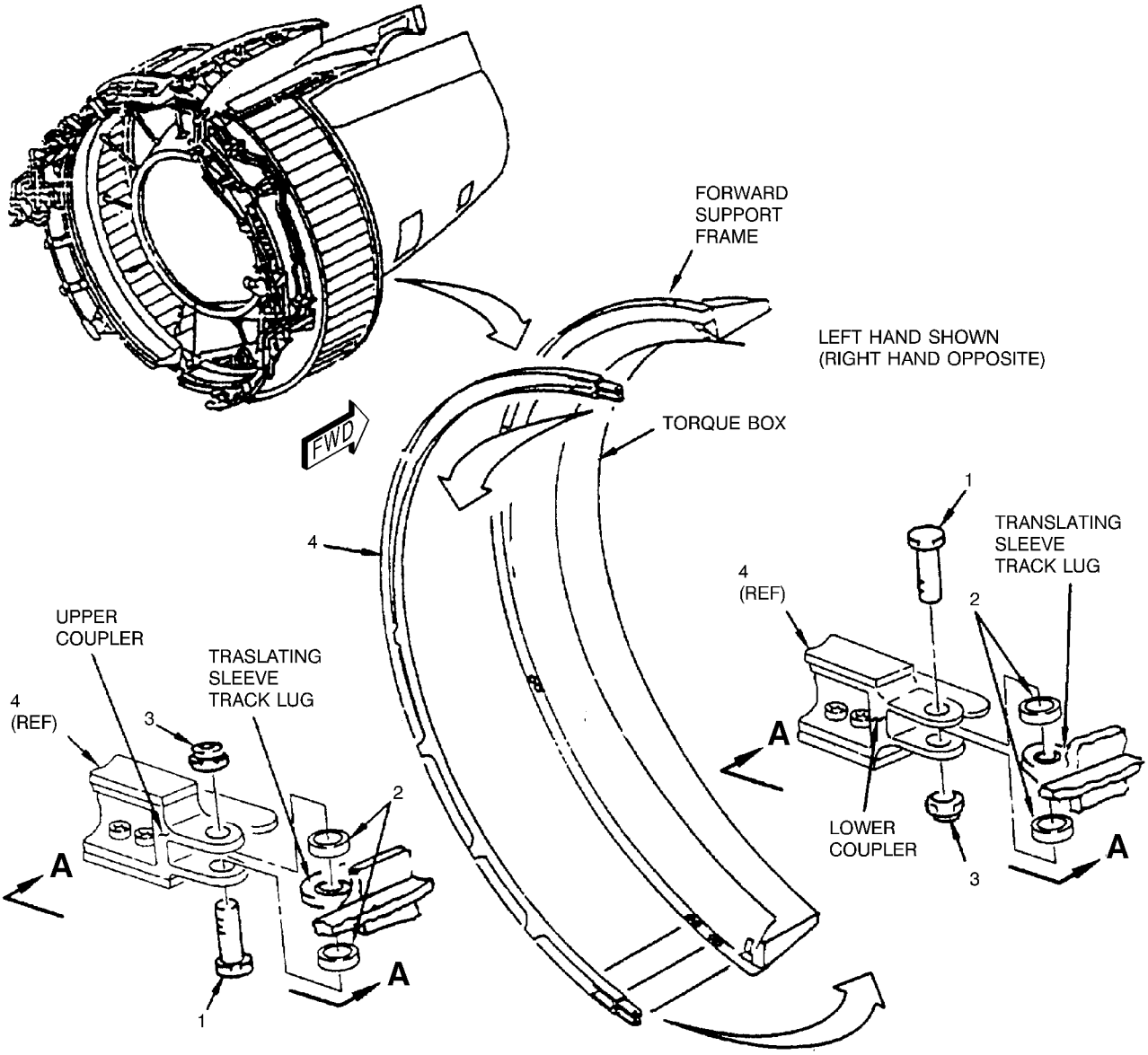
WARNING : USE SEALING COMPOUND (MATERIAL NO.P09-013) ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH SKIN. PRIOR TO USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

R (16)Repeat steps 2.C.(2) through 2.C.(10) to perform a final gap measurement between the bumper pads on the aft cascade support frame and the ramps on the translating sleeve (Ref. Fig. 402).
Wet-install the screws and washers on the cascades with Sealing Compound (Material No.P09-013).

R (17)Review the measurements of the gap between the ramps on translating sleeve inner panel and the pads on the aft cascade support frame

R assembly. If a gap is not between 0.010 and 0.080 in. (0.25 and
R 2.03 mm), do the steps that follow :
R (a)Drill out the rivets (1) that attach the pad (2) and shims to the aft
R cascade support frame assembly (Ref. Fig. 402).
R (b)Determine the combination of plates (3) and shims (4) necessary to
R maintain a 0.010 - 0.080 in. (0.25 - 2.03 mm) nominal gap between
R the frame bumper pad (2) and the ramp on the translating sleeve.
R WARNING : BEFORE YOU USE CHEMICALS, READ UNDERSTAND, AND
R OBEY ALL SAFETY INSTRUCTIONS FOR THE CHEMICALS.
R THESE INSTRUCTIONS INCLUDE INSTRUCTIONS FROM THE
R MANUFACTURER, THE MATERIAL SAFETY DATA SHEET (MSDS),
R AND GOVERNMENT REGULATIONS. CHEMICALS MAY CAUSE
R INJURY TO YOU OR MAKE YOU SICK WHEN SAFETY INSTRUCTIONS
R ARE NOT OBEYED. AN MSDS GIVES INSTRUCTIONS ON HOW YOU
R MUST SAFELY USE, KEEP, AND DISCARD CHEMICALS. GET
R INSTRUCTIONS FROM YOUR EMPLOYER ON HOW YOU MUST SAFELY
R USE, KEEP, AND DISCARD CHEMICALS.
R (c)Wet-install rivets (1) plates (3), and shims (4), as necessary, to
R attach the pad (2) to the aft cascade support frame with Epoxy
R Primer (Material No. P18-016). Lengths of rivets are determined by
R the thickness of the pads and shims.
R (d)Measure the gap between the bumper pad on the aft cascade support
R frame and the ramp on the translating sleeve. If the gap is not
R between 0.010 - 0.080 in. (0.25 - 2.03 mm), do steps 2.C.(17)(a)
R through 2.C.(17)(d) again.

D. Close-Up
(1)Remove access platform.
(2)Manually translate the thrust reverser sleeves to the stowed position (Ref. 78-32-11, P. Block 201).
(3)Check there is no binding while thrust reverser translating sleeves are displaced.
(4)Perform operational test (Ref. 78-32-11, P. Block 501).
(5)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(6)Close fan cowl doors, remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



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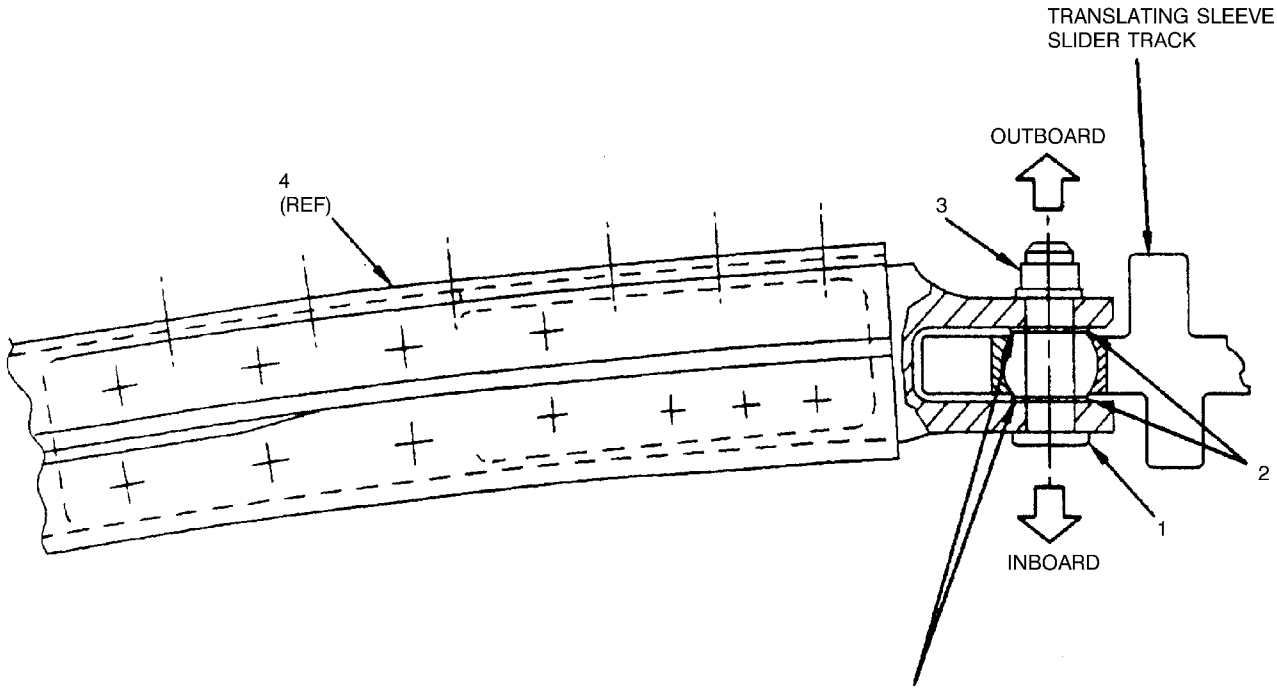
LEGEND :

1. PIN
2. WASHER
3. NUT
4. AFT CASCADE SUPPORT FRAME ASSY

L-A071T (1000)

Aft Cascade Support Assembly (Sheet 1/2)
Figure 401



LEFT HAND SHOWN
(RIGHT HAND OPPOSITE)

LOOKING FORWARD

VIEW A-A
(TYPICAL 4 PLACES)

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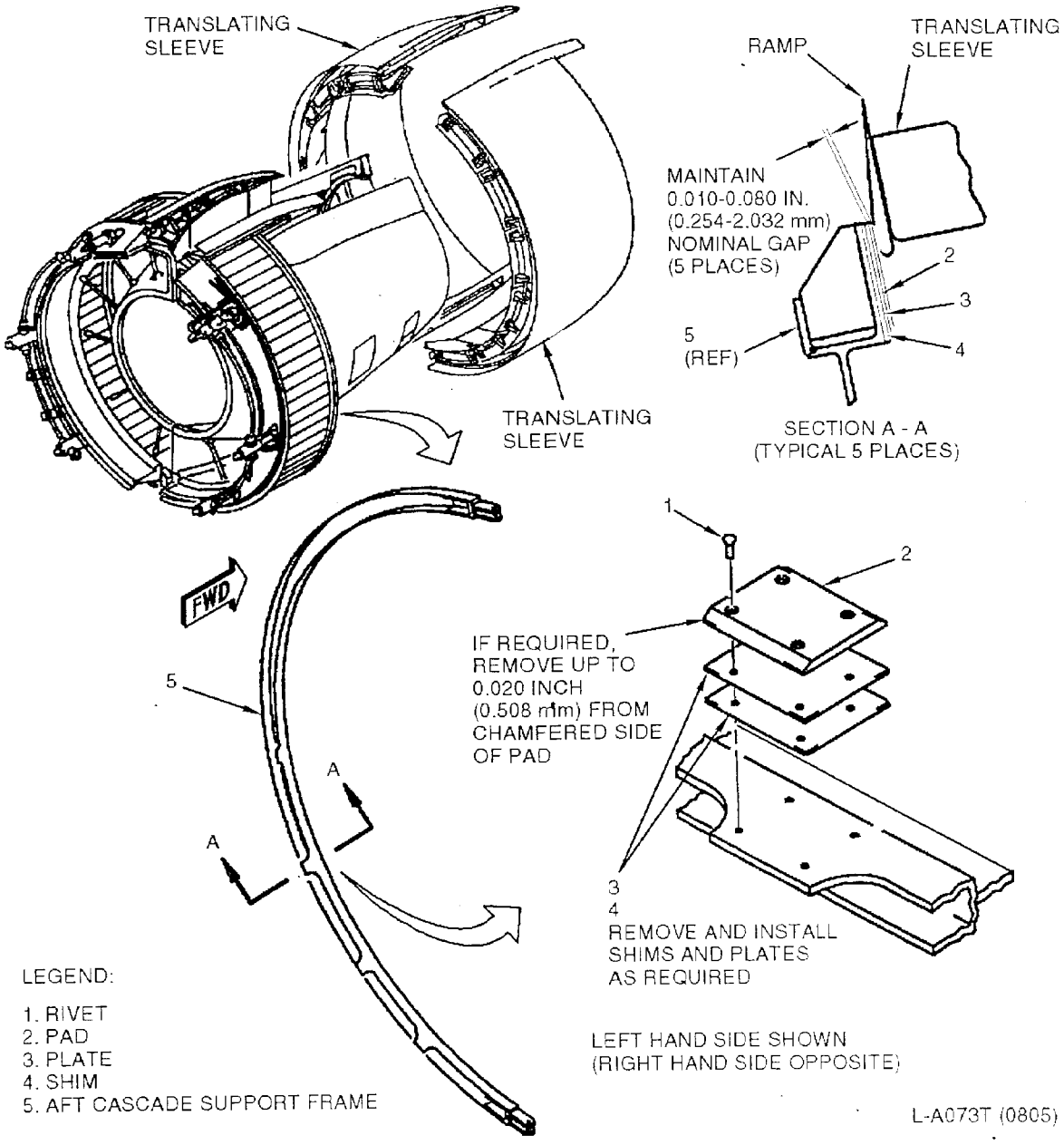
L-A072T (1000)

Aft Cascade Support Assembly /Sheet 2/2)
Figure 401



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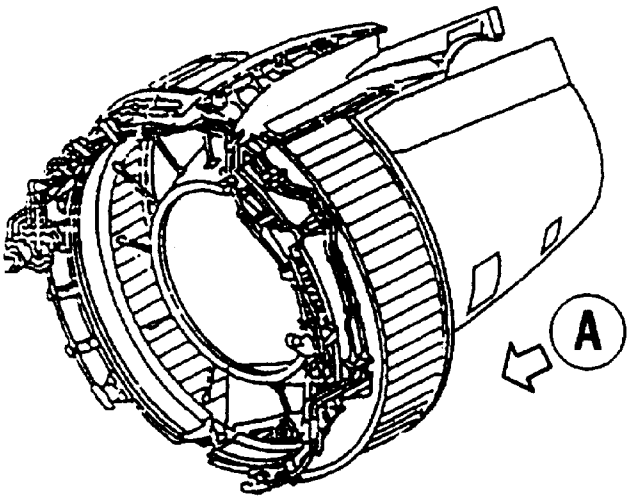
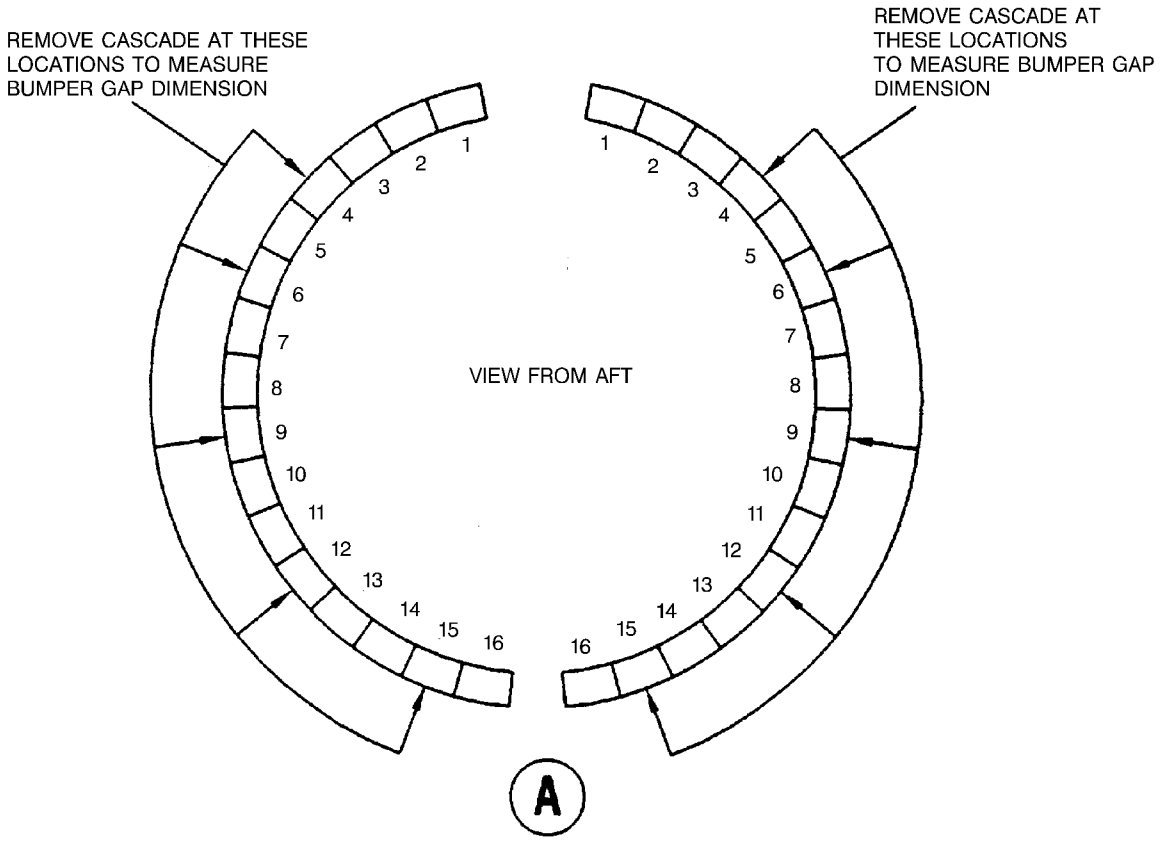
Pads, Plates and Shims on Aft Cascade Support Frame Assembly
Figure 402

R





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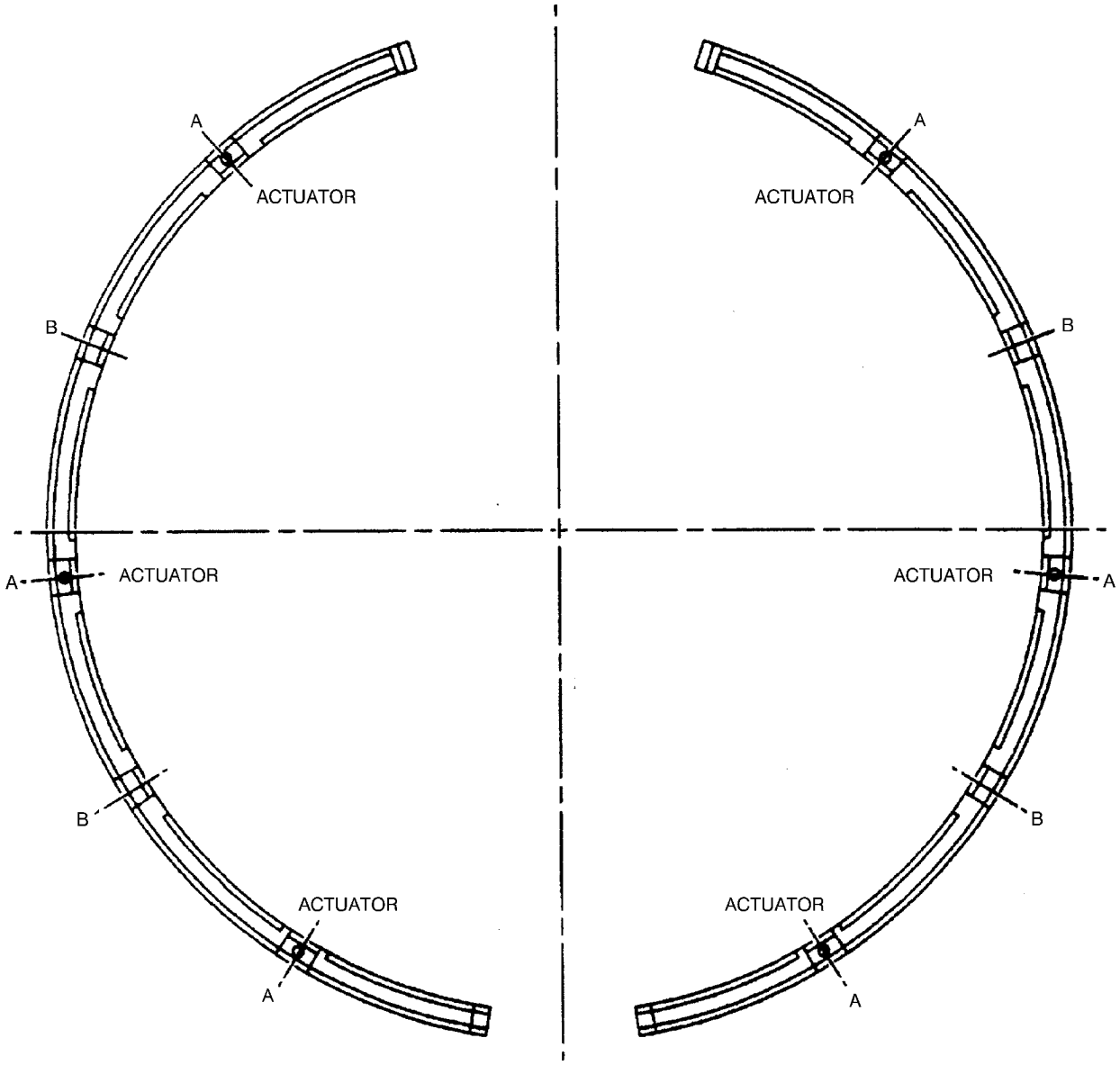
L-A074T (1000)

Thrust Reverser Cascade Locations
Figure 403

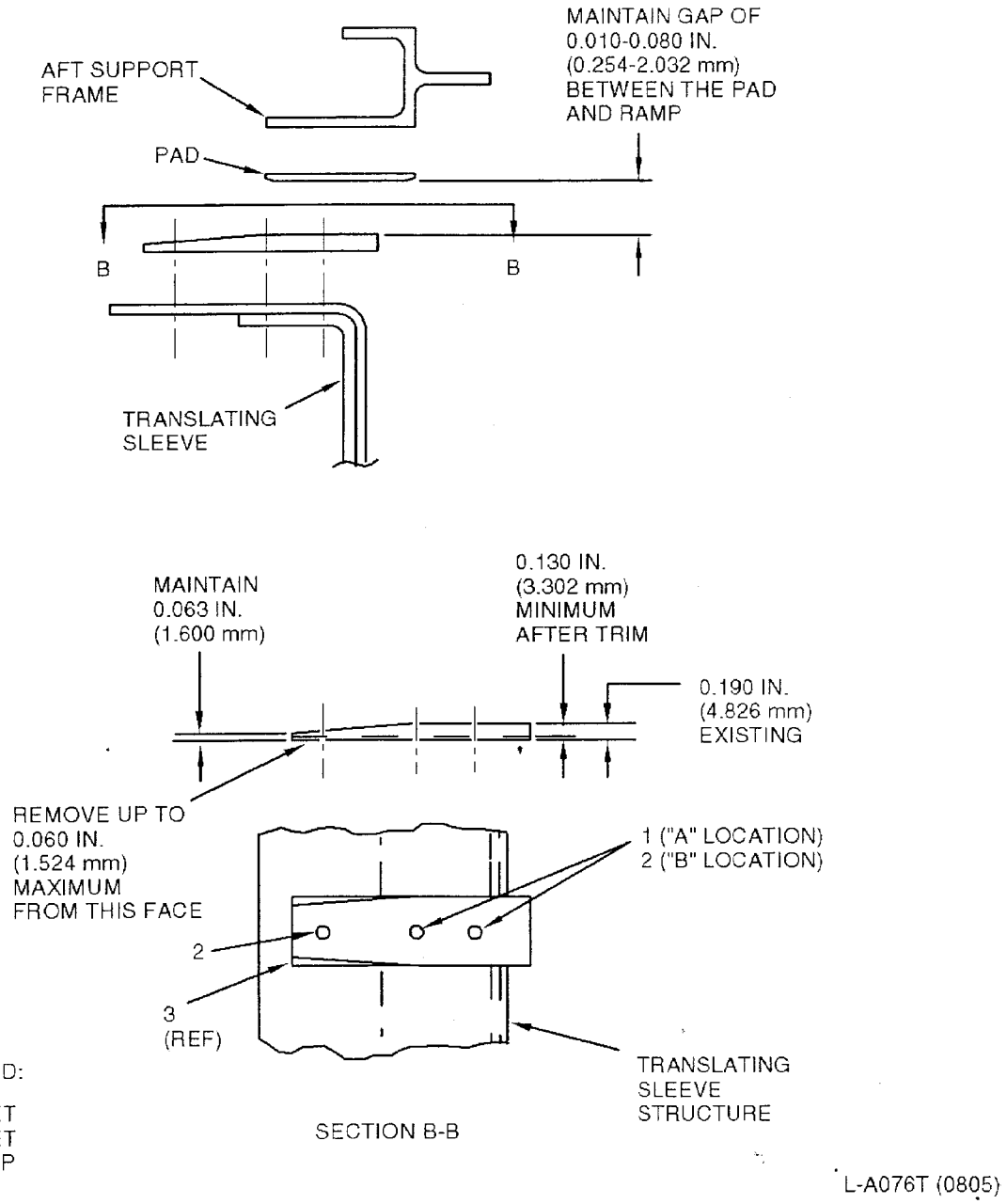


VIEW LOOKING FORWARD

BM5 78 32 16 4 KGMA 00

L-A075T (1000)

Thrust Reverser Sleeve Ramps (Sheet 1/2)
Figure 404



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Thrust Reverser Sleeve Ramps (Sheet 2/2)
Figure 404

R

THRUST REVERSER CASCADE SUPPORT FRAME ASSEMBLY - INSPECTION/CHECK

R 1. Inspection of Thrust Reverser Cascade Support Frame Assembly

R A. Equipment and Materials

ITEM	DESIGNATION
R (1)	Circuit Breaker Safety Clips
R (2)	Access Platform
R (3)	Lint-Free Cloth
R (4)Material No.P05-023	Special Materials (Ref. 70-00-00)
R (5)Material No.P11-043	Cleaning Agents (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Translating Sleeves - Thrust Reverser
- 78-32-11, P. Block 401	Translating Sleeves - Thrust Reverser
- 78-32-12, P. Block 401	Thrust Reverser Cascades
- 78-32-16, P. Block 401	Thrust Reverser Cascade Support Frame Assembly

R B. Job Set-Up

(1)Open, safety and tag the appropriate circuit breakers and open applicable fan cowl doors to the full open position (Ref. 71-13-00, P. Block 301).

(2)Manually translate the thrust reverser sleeves to deployed position (Ref. 78-32-11, P. Block 201).

(3)Open the thrust reverser doors (Ref. 71-13-00, P. Block 301).

(4)Install access platform.

R C. Procedure (Ref. Fig. 601, 602)

CAUTION : THRUST REVERSER DOORS MUST BE CLOSED AND LATCHED BEFORE OPERATION OF ANY THRUST REVERSER SYSTEM.

WARNING : MATERIAL NO.P11-043, METHYL ISOBUTYL KETONE (MIBK), IS FLAMMABLE AND THE VAPOR IS HARMFUL. USE IN A WELL VENTILATED AREA. AVOID PROLONGED BREATHING OF VAPOR OR PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE IRRITATION OF EYES, NOSE, THROAT AND SKIN. HIGH CONCENTRATIONS MAY CAUSE WEAKNESS, HEADACHE, NAUSEA, DIZZINESS AND IMPAIRED JUDGEMENT. PROTECTIVE GLOVES SHOULD BE WORN DURING USE. MAY CAUSE DERMATITIS BY REMOVING SKIN OILS. PRIOR TO USE OF THIS PRODUCT, CAREFULLY READ THE APPLICABLE "MATERIAL SAFETY DATA SHEET" AND FOLLOW ALL LISTED SAFETY AND HEALTH PRECAUTIONS.

(1)Remove cascades to gain access to the aft support frame. Identify cascade installation position on cascade with a Crayon (Material No.P05-023) (Ref. Fig. 601).

CAUTION : A MAXIMUM OF ONE CASCADE PER THRUST REVERSER HALF CAN BE REMOVED WITHOUT ADVERSELY AFFECTING CONTOUR OF THE AFT CASCADE SUPPORT FRAME. REMOVAL OF CASCADES CAUSES THE AFT CASCADE SUPPORT FRAME TO LOSE CONTOUR, A GAP CHECK BETWEEN THE TRANSLATING SLEEVE INNER PANEL AND AFT CASCADE SUPPORT FRAME IS REQUIRED (REF. 78-32-16, P. BLOCK 401).

(2)Remove bolts and washers attaching cascade to thrust reverser and aft support frame.
(3)Clean the cascade support frame assembly with a clean cloth moistened with Methyl Isobutyl Ketone (MIBK) (Material No.P11-043). Wipe the surface dry before the solvent evaporates.
(4)Using a bright light, visually inspect the cascade aft support frame for cracks. Closely inspect the frame area next to all nutplates and end fitting fasteners. If a crack is suspected, perform a Penetrant Inspection (Ref. NTM 51-90-90). If a crack is found, replace the aft support frame (Ref. 78-32-16, P. Block 401) (Ref. Fig. 602).
(5)Inspect insulator for any damage. If damage is found, replace the insulator.
CAUTION : IF MORE THAN ONE CASCADE HAS BEEN REMOVED AT ONE TIME, A GAP CHECK IS REQUIRED BETWEEN THE FIVE TRANSLATING SLEEVE INNER PANELS AND AFT CASCADE RING PADS (REF. 78-32-16, P. BLOCK 401).

R D. Install cascades (Ref. 78-32-12, P. Block 401).

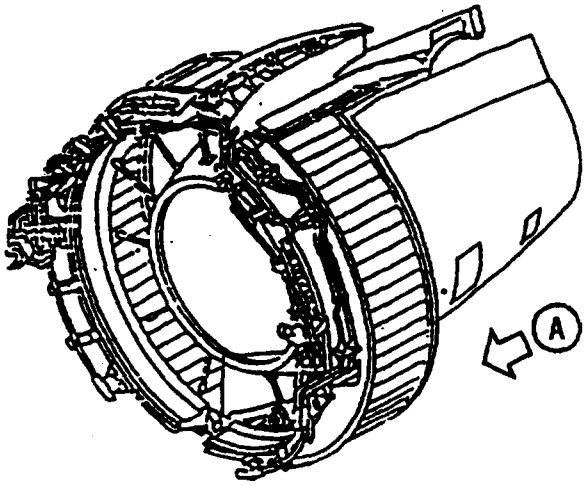
R E. Close-Up
(1)Remove access platform.
(2)Manually translate the thrust reverser to stowed position (Ref. 78-32-11, P. Block 201).
(3)Close fan cowl doors (Ref. 71-13-00, P. Block 301).
(4)Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

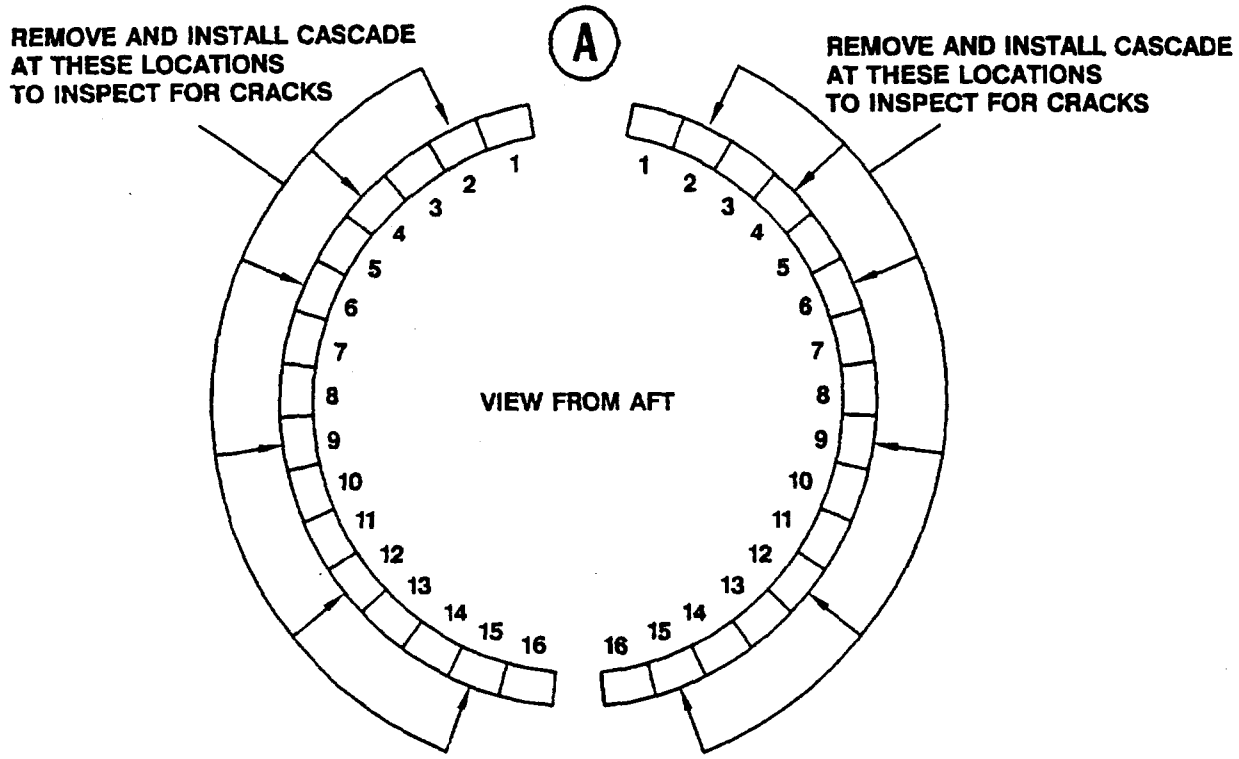
R 2. Inspection of Thrust Reverser Track Beam Lug Bearing Ball

R A. Equipment and Materials

ITEM	DESIGNATION
(1)	Circuit Breaker Safety Clips
(2)	Access Platform
(3)	Lint-Free Cloth
(4)	Flashlight
(5)Material No.P11-043	Cleaning Agents (Ref. 70-00-00)
(6)Material No.P11-005A	Cleaning Agents (Ref. 70-00-00)
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 78-32-11, P. Block 201	Translating Sleeves - Thrust Reverser
- 78-32-16, P. Block 401	Thrust Reverser Cascade Support Frame Assembly

R B. Job Set-Up
R (1)Open, safety and tag the appropriate circuit breakers and open applicable fan cowl doors to the full open position (Ref. 71-13-00, P. Block 301).
R (2)Manually translate the thrust reverser sleeves to deployed position (Ref. 78-32-11, P. Block 201).
R (3)Open the thrust reverser doors (Ref. 71-13-00, P. Block 301).
R (4)Install access platform.





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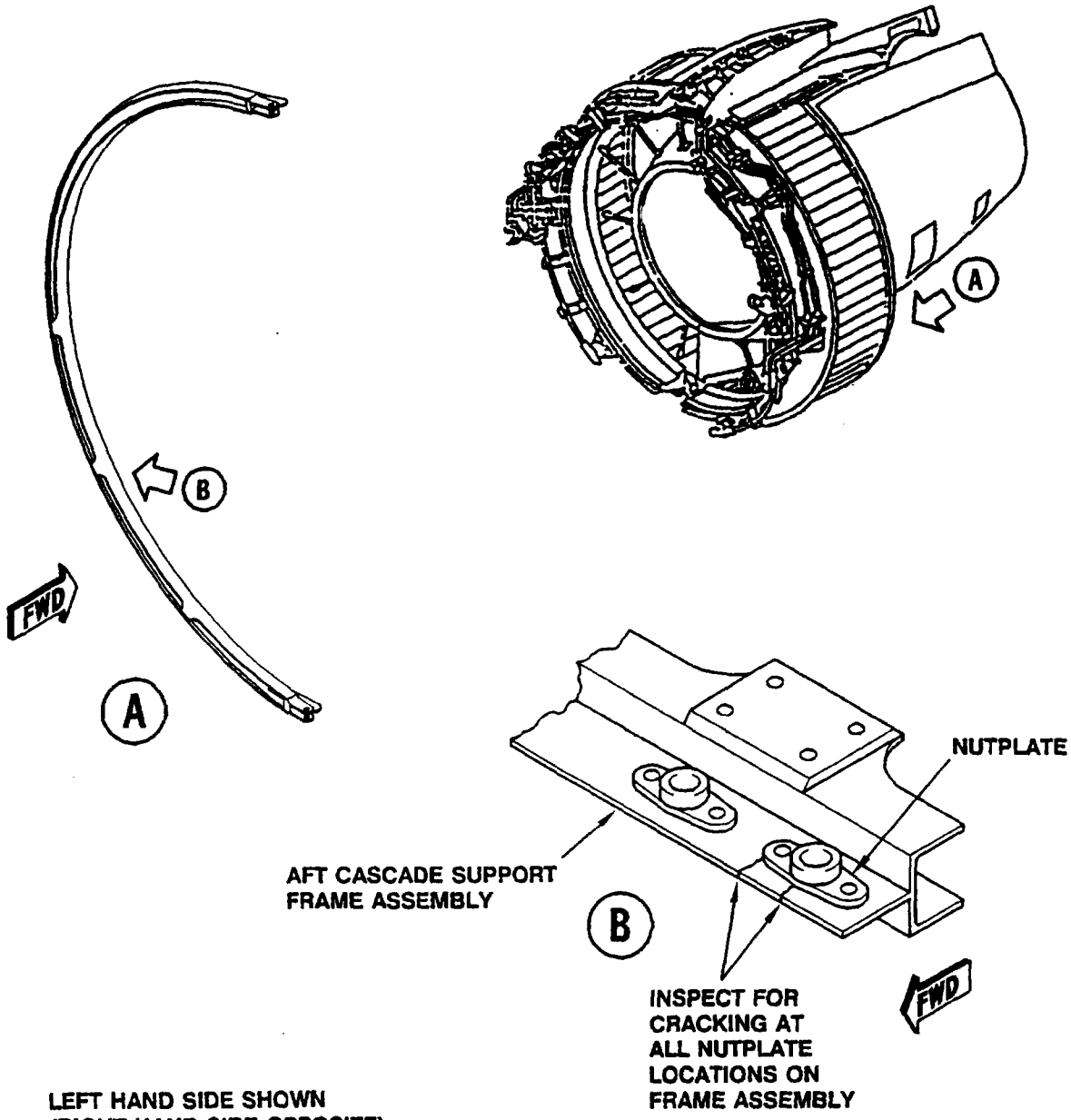
Thrust Reverser Cascades
Figure 601



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Thrust Reverser Aft Cascade Frame
Figure 602

R (5)Remove the aft cascade support frame (Ref. 78-32-16, P. Block 401).

R C. Procedure

R WARNING : BEFORE YOU USE CHEMICALS, READ, UNDERSTAND AND OBEY ALL SAFETY
R INSTRUCTIONS FOR THE CHEMICALS. THESE INSTRUCTIONS INCLUDE
R INSTRUCTIONS FROM THE MANUFACTURER, THE MATERIAL SAFETY DATA
R SHEET (MSDS), AND GOVERNMENT REGULATIONS. CHEMICALS MAY CAUSE
R INJURY TO YOU OR MAKE YOU SICK WHEN SAFETY INSTRUCTIONS ARE NOT
R OBEYED. AN MSDS GIVES INSTRUCTIONS ON HOW YOU MUST SAFELY USE,
R KEEP AND DISCARD CHEMICALS. GET INSTRUCTIONS FROM YOUR EMPLOYER
R ON HOW YOU MUST SAFELY USE, KEEP AND DISCARD CHEMICALS.

R (1)Clean the track beam lug with a clean cloth moistened with MIBK/MEK blend (60 percent of Material No.P11-043/40 percent of Material No.P11-005A). Wipe the surface dry before the solvent evaporates.

R (2)Use a bright light, visually inspect the track beam lug, with bearings installed, for any sign of surface damage. If any damage is found, contact Goodrich representative for disposition.

R (3)Visually inspect bearings for condition. If any damage is found, contact Goodrich representative for disposition.

R (4)Rotate the bearing ball 90 degrees from the installed position and push out through the slot.

R (5)Inspect the inner race for condition. If any damage is found, contact Goodrich representative for disposition.

R (6)If no damage is found on the inner race of the bearing, continue use of the inner race and install a new ball.

R D. Close-Up

R (1)Remove access platform.

R (2)Install aft cascade support frame (Ref. 78-32-16, P. Block 401).

R (3)Manually translate the thrust reverser to stowed position (Ref. 78-32-11, P. Block 201).

R (4)Close fan cowl doors (Ref. 71-13-00, P. Block 301).

R (5)Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

THRUST REVERSER DRAIN TUBE - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breakers Safety Clips
B.	Rivet
C.	Torque Wrench 10 - 20 lbf.in. (1.13 - 2.26 m.daN)
Referenced Procedure - 71-13-00, P. Block 301	Cowl Doors

2. Procedure

A. Job Set-Up

CAUTION : SOME THRUST REVERSER ACTUATION SYSTEM COMPONENTS ARE ELECTRICALLY CONNECTED TO WEIGHT ON WHEELS (WOW) SWITCHES. DO NOT OPEN THESE CIRCUIT BREAKERS.

(1) Open and tap following circuit breakers for appropriate engine (Ref. 71-13-00, P. Block 301).
(2) Open the right hand fan cowl door (Ref. 71-13-00, P. Block 301).

B. Removal (Ref. Fig. 401)

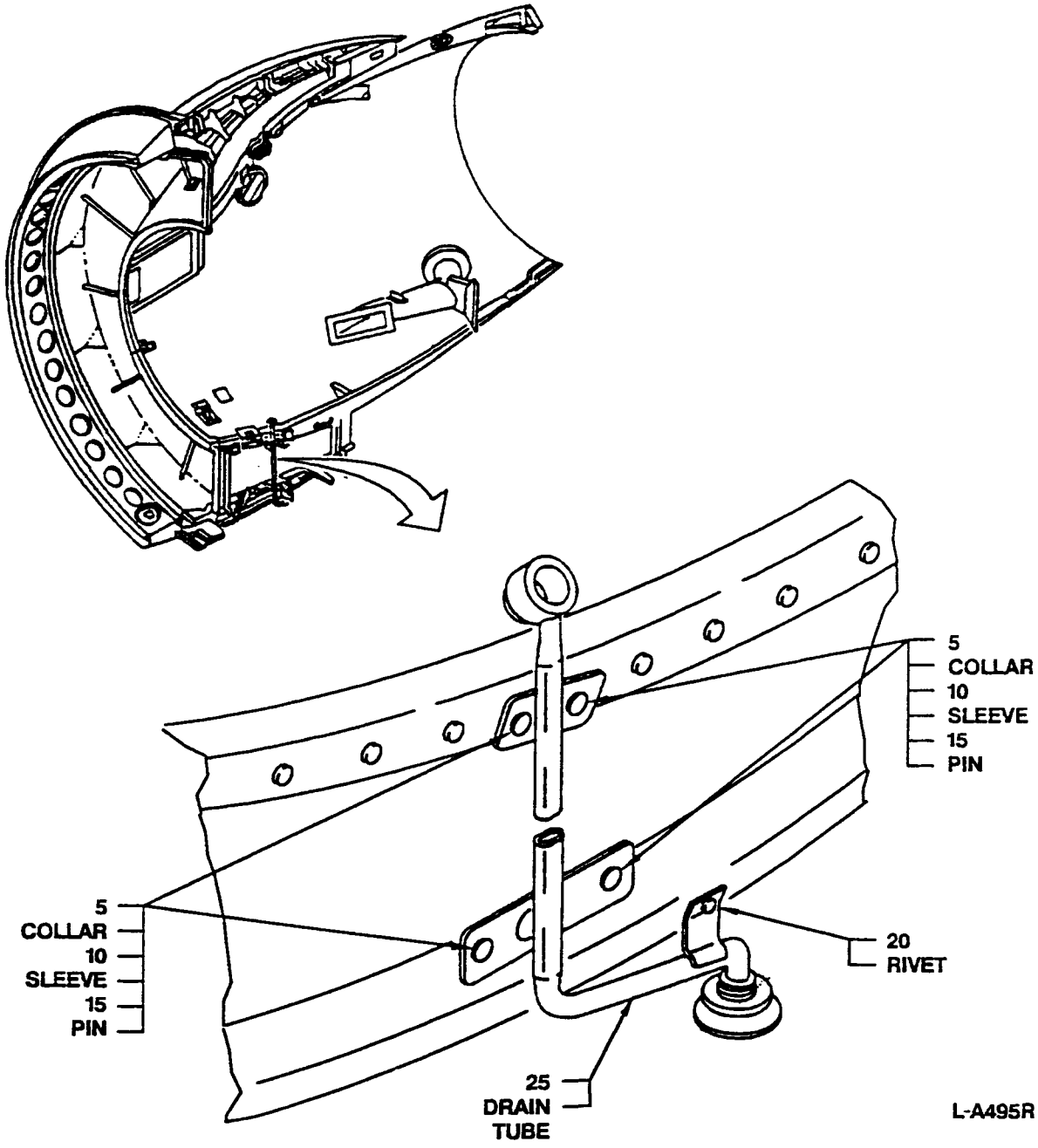
(1) Remove the pins (15), sleeves (10) and collars (5) that attach the upper drain tube brackets to the bifurcation wall.
(2) Remove the two pins (15), sleeves (10) and collars (5) that attach the lower drain tube bracket to the bifurcation wall.
(3) Drill out the rivet (20) that attaches the end tube bracket to the bifurcation wall.
(4) Remove the drain tube (25).

C. Installation (Ref. Fig. 401)

(1) Align the drain tube (25) bracket holes with the attachment holes on the lower bifurcation wall. Fasten the drain tube through the bracket holes.
(2) Install the rivet (20) that attaches the tube bracket to the bifurcation wall.
(3) Install the two pins (15), sleeves (10), collars (5) on the lower bracket.
(4) Install the two pins (15), sleeves (10) and collars (5) on the upper bracket.
(5) TORQUE the pins (15) to between 10 and 20 lbf.in. (1.13 and 2.26 daN).

D. Close-Up

(1) Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2) Close the right hand fan cowl door (Ref. 71-13-00, P. Block 301).
(3) Remove tags and close following circuit breakers for appropriate engine (Ref. 71-13-00, P. Block 301).



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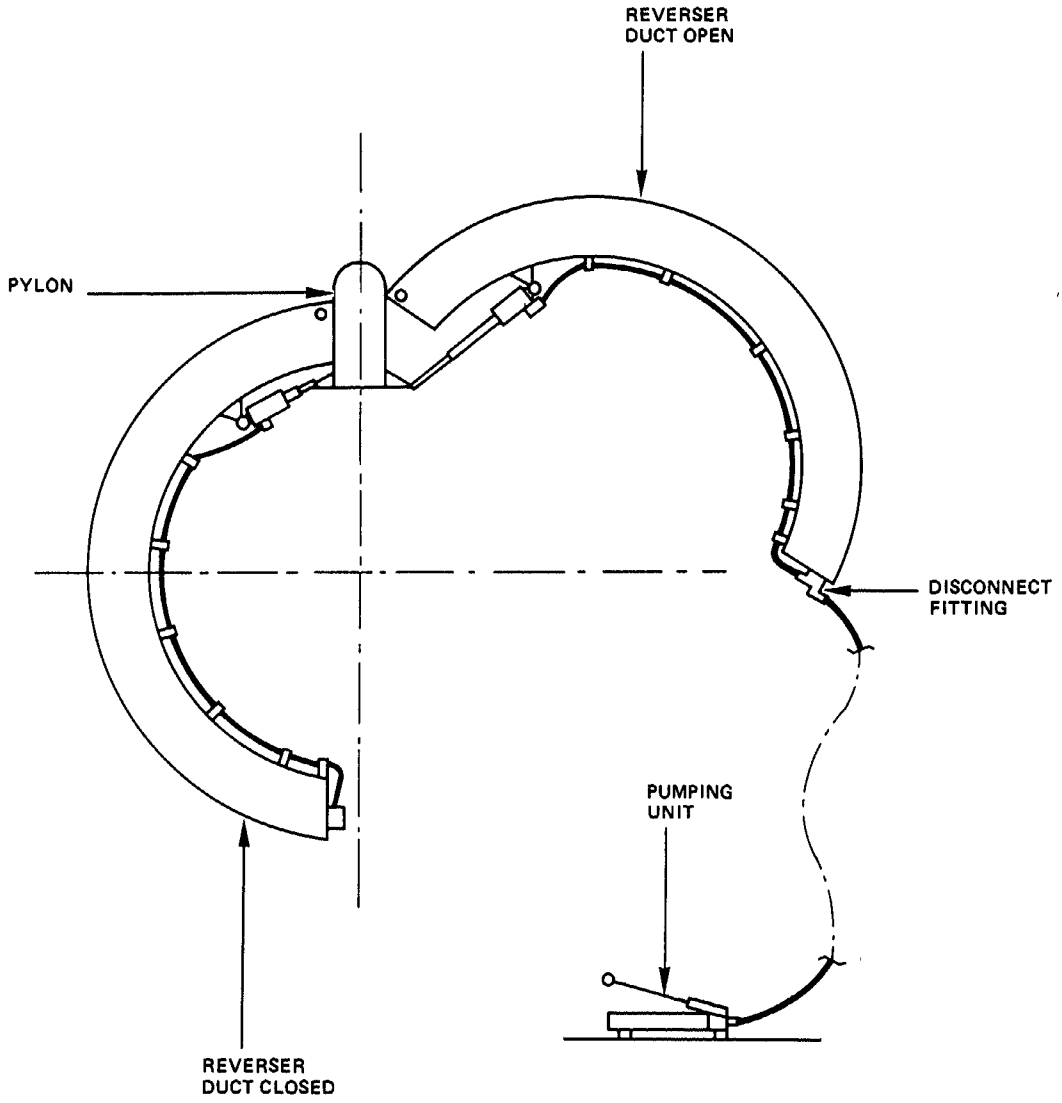
Thrust Reverser Drain Tube
Figure 401

THRUST REVERSER DOOR OPENING MECHANISM - DESCRIPTION AND OPERATION

1. General (Ref. Fig. 001, 002)
   Each reverser door has an hydraulic jack mounted between the door and the pylon. A GSE handpump can be connected to the door to be operated only after the door has been opened a small amount ensuring that all latches are completely disengaged.
   The system uses engine oil. The reverser halves can be supported in the 40° open position for maintenance by telescoping hold-open rods normally stored on the reverser or at 53° for an engine change. Hold open rods only work in the 40° position.

2. Component Location
   (Ref. Fig. 002)

FIN	FUNCTIONAL DESIGNATION	PANEL	ZONE	ACCESS DOOR	ATA REF.
	ACTUATOR - DOOR OPENING, L ENG1 (ENG2)		451	451AL	78-36-01
			461	461AL	
	ACTUATOR - DOOR OPENING, R ENG1 (ENG2)		452	452AR	78-36-01
			462	462AR	
	MANIFOLD - DOOR OPENING ACTUATOR, L ENG1 (ENG2)		451	435AL	78-36-02
			461	451AL	
				445AL	
				461AL	
	MANIFOLD - DOOR OPENING ACTUATOR, R ENG1 (ENG2)		452	436AR	78-36-02
			462	452AR	
				446AR	
				462AR	



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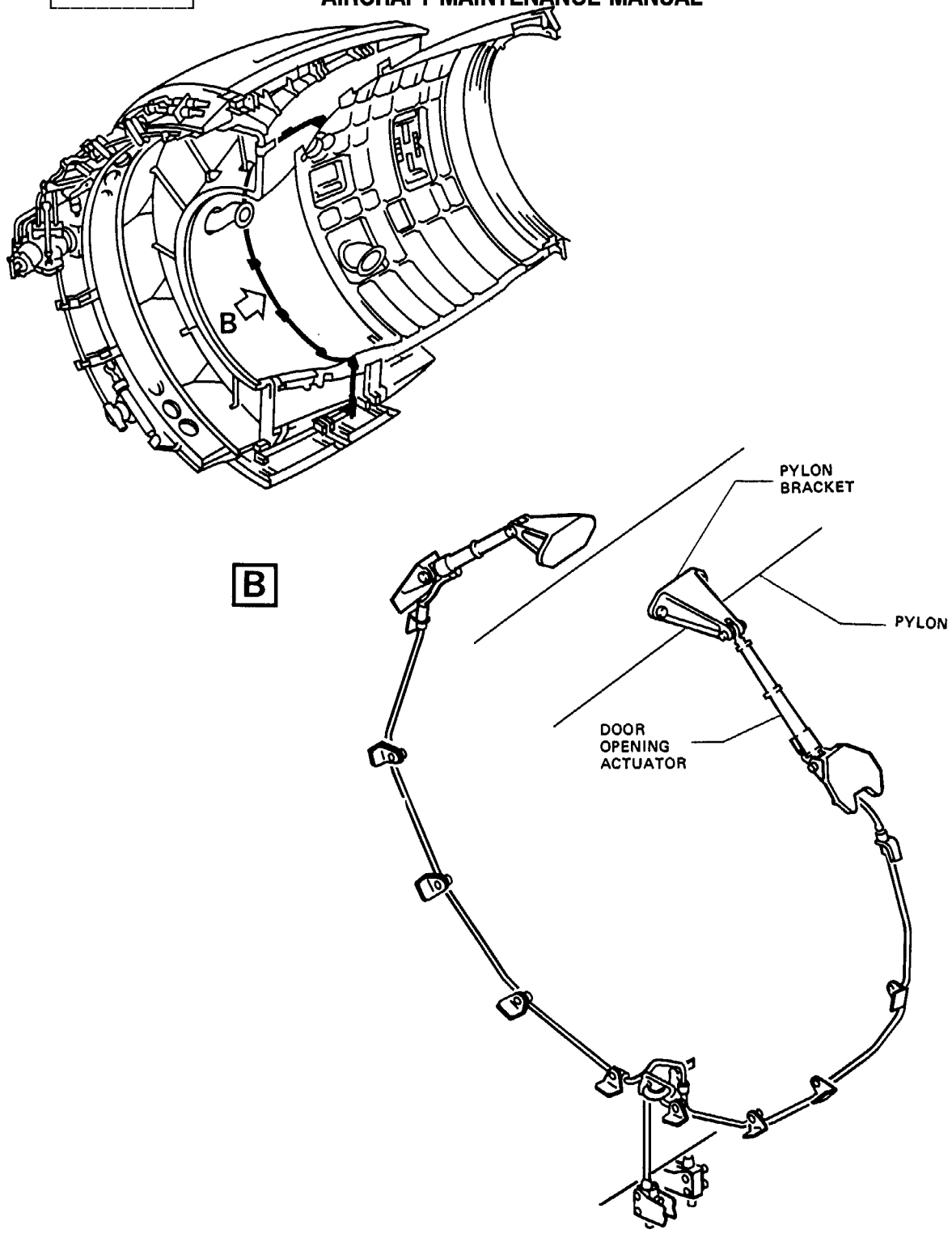
Thrust Reverser Door Hydraulic Opening Actuation System
Figure 001



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Thrust Reverser Door Hydraulic Opening Actuation System - Component Location
Figure 002

THRUST REVERSER DOOR OPENING ACTUATOR - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breakers Safety Clips
C.	Container, 1 US gal. (3.785 l)
D. Material No.P03-001	Oils (Ref. 70-00-00)
E.	Packing
F.	Cotter Pin
G. RSE1002	Hydraulic Pump - Hand Operated
H. RSE1005	Sling, Thrust Reverser
Referenced Procedure - 71-13-00, P. Block 301	Cowl Doors

2. Procedure (Ref. Fig. 401)

A. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open thrust reverser cowl doors. (Ref. 71-13-00, P. Block 301)
(2)Install access platform

B. Removal
(1)Support thrust reverser door in open position with RSE1005 sling.
(2)Position container to receive residual fluid from actuator.
(3)Disconnect hose attached to actuator and drain fluid from actuator into container.
(4)Remove bolts, washers, nuts, and cotter pins attaching actuator to thrust reverser door and to pylon and remove actuator.
(5)Remove union and packing from actuator. Discard packing.

C. Installation
(1)Lubricate packing (6) with Material No.P03-001, and install on union (4).
(2)Install union (4) threads lubricated with Material No.P03-001, in actuator (1) and TORQUE union to between 90 and 100 lbf.in. (1.02 and 1.13 m.daN).
(3)Attach actuator to pylon fitting with bolt (7) threads lubricated with Material No.P03-001, nut (3) and washers (9) and (10).
(4)TORQUE nut to between 50 and 70 lbf.in. (0.56 and 0.79 m.daN.), and install cotter pin (8).
(5)Attach lower end of actuator to thrust reverser door fitting with bolt (7) threads lubricated with Material No.P03-001, washer (2) and nut (3). TORQUE nut to between 50 and 70 lbf.in. (0.56 and 0.79 m.daN.) and install cotter pin (5).
(6)Connect hose to actuator and TORQUE hose coupling to between 135 and 150 lbf.in. (1.52 and 1.69 m.daN.).
WARNING : MAKE CERTAIN THAT HYDRAULIC PUMP IS PROPERLY CONNECTED TO THE THRUST REVERSER MATING CONNECTOR BY PULLING ON PUMP HOSE WITH MODERATE FORCE. THE CONNECTION MUST BE MADE CORRECTLY,

OTHERWISE THRUST REVERSER DOOR OPENING SYSTEM WILL NOT BE PRESSURIZED AND THE REVERSER DOOR COULD PARTIALLY CLOSE UNEXPECTEDLY IF THE HOLD-OPEN ROD LOCKING COLLARS ARE RELEASED, OR FULLY CLOSE IF THE HOLD-OPEN RODS ARE DISCONNECTED FROM ENGINE BRACKETS:

(7)Connect hydraulic pump to door opening actuator manifold near center latch.

WARNING : INCOMPLETE BLEEDING OF ACTUATOR SYSTEM WILL RESULT IN ENTRAPPED AIR. ENTRAPPED AIR IN SYSTEM MAY ALLOW DOOR TO CLOSE ABRUPTLY RESULTING IN POSSIBLE INJURY TO PERSONNEL.

(8)Bleed door opening actuator system.

(a)Slowly apply hydraulic pressure to manifold at bottom centerline of thrust reverser door with RSE1002 hand- operated pump. Open door to a minimum of 53 degrees.

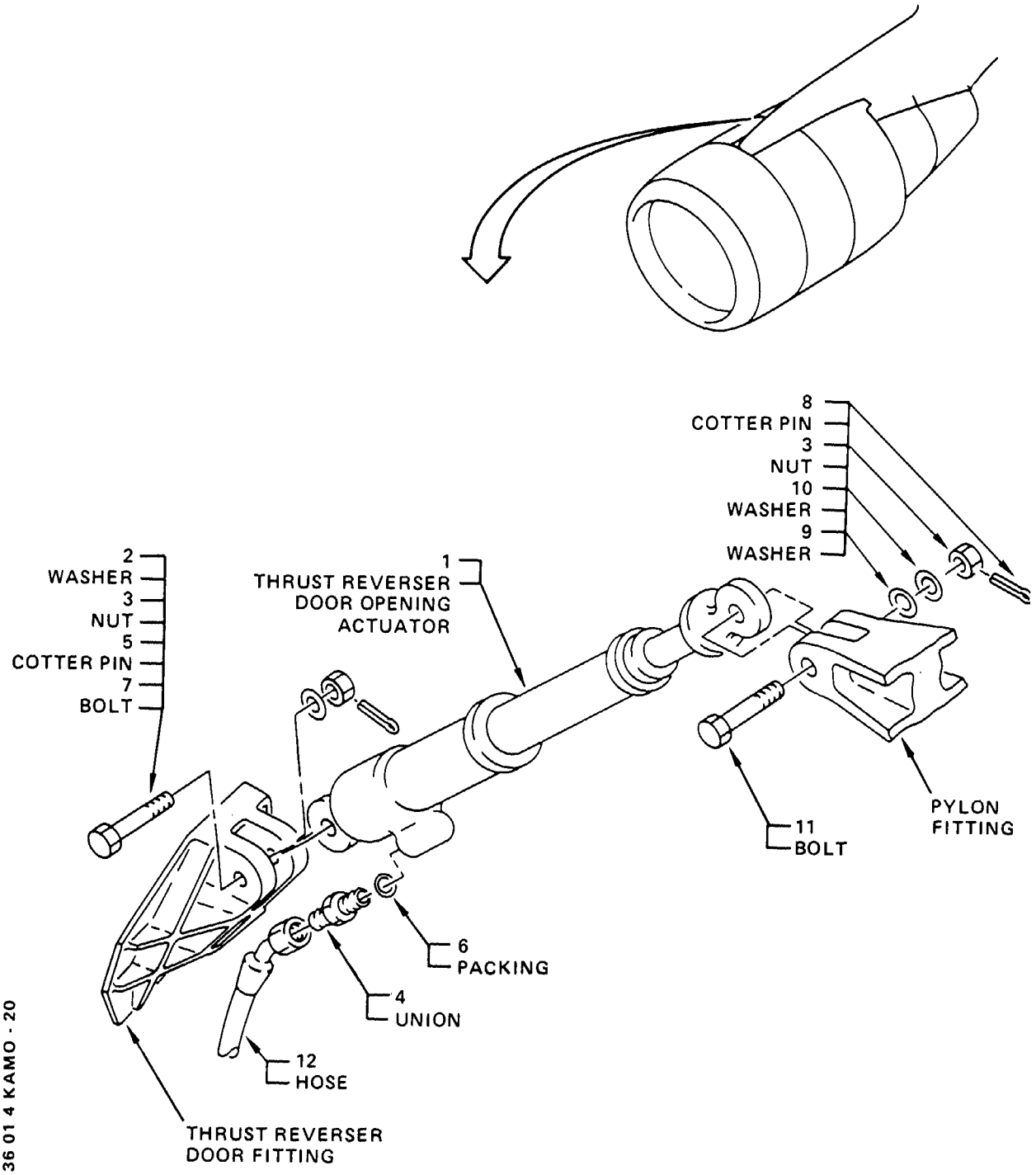
(b)Slowly reduce pump pressure to allow the door to close gradually. Repeat opening and closing door three times to bleed entrapped air from system.

D. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(2)Remove access platform.

(3)Remove safety clips and tags and close circuit breakers. Close thrust reverser cowl doors. (Ref. 71-13-00, P. Block 301).



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Thrust Reverser Door Opening Actuator
Figure 401

THRUST REVERSER DOOR OPENING ACTUATOR MANIFOLD REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Access Platform
B.	Circuit Breakers Safety Clips
C. Material No.P03-001	Oils (Ref. 70-00-00)
D.	Container, 1 US gal (3.8 l)
E.	Protective Caps
F.	Packing
G. RSE1002	Hydraulic Pump - Hand Operated
Referenced Procedure - 71-13-00, P. Block 301	Cowl Doors

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the circuit breakers and open thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.

B. Removal (Ref. Fig. 401)
(1)Position container to receive residual fluid in tubes and disconnect tube from manifold.
(2)Remove bolts, washers, and nuts attaching manifold to bracket and remove manifold.
(3)Remove union and packing from manifold. Discard packing.
(4)Remove dust cover from manifold and install protective covers on tubing and manifold ports.
(5)Remove bolts, nuts, washers, and clamps attaching tube to thrust reverser door.
(6)Disconnect tube from union and remove tube.
(7)Disconnect hose from actuator and remove hose.
(8)Remove nut and union from bracket.
(9)Install protective covers on open tube, hose and actuator port.

C. Installation (Ref. Fig. 401)
(1)Remove protective covers.
(2)Install union (9) threads lubricated with Material No.P03-001 and nut (3) on bracket below actuator.
(3)Torque nut.
(4)Connect hose (2) to union (9) and to actuator. Torque couplings.
(5)Connect tube (14) to union (9) and torque coupling nut.
(6)Attach tube to thrust reverser door with bolts (12) threads lubricated with Material No.P03-001, nuts (6), washers (4), and clamps (5). Torque nuts.
(7)Install dust cover on door opening actuator manifold port.
(8)Lubricate packing (10) with oil, Material No.P03-001, and install on

union (8).

(9) Install union (8) threads lubricated with Material No.P03-001, in door opening actuator manifold (1) and torque union.

(10) Align manifold on bracket and attach with bolts (11) threads lubricated with Material No.P03-001, washers (5), and nuts (7). Torque nuts (7).

(11) Connect tube (14) threads lubricated with Material No.P03-001 to manifold and torque coupling.

WARNING : MAKE CERTAIN THAT HYDRAULIC PUMP IS PROPERLY CONNECTED TO THE THRUST REVERSER MATING CONNECTOR BY PULLING ON PUMP HOSE WITH MODERATE FORCE. THE CONNECTION MUST BE MADE CORRECTLY, OTHERWISE THRUST REVERSER DOOR OPENING SYSTEM WILL NOT BE PRESSURIZED AND THE REVERSER DOOR COULD PARTIALLY CLOSE UNEXPECTEDLY IF THE HOLD-OPEN ROD LOCKING COLLARS ARE RELEASED, OR FULLY CLOSE IF THE HOLD-OPEN RODS ARE DISCONNECTED FROM ENGINE BRACKETS.

(12) Connect hydraulic pump to door opening actuator manifold near center latch.

WARNING : INCOMPLETE BLEEDING OF ACTUATOR SYSTEM WILL RESULT IN ENTRAPPED AIR. ENTRAPPED AIR IN SYSTEM MAY ALLOW DOOR TO CLOSE ABRUPTLY RESULTING IN POSSIBLE INJURY TO PERSONNEL.

(13) Bleed door opening actuator system.

(a) Slowly apply hydraulic pressure, 3000 psig maxi (206.8 bars) to manifold at bottom centerline of thrust reverser door with RSE1002 hand-operated pump. Open door toa minimum of 53 degrees.

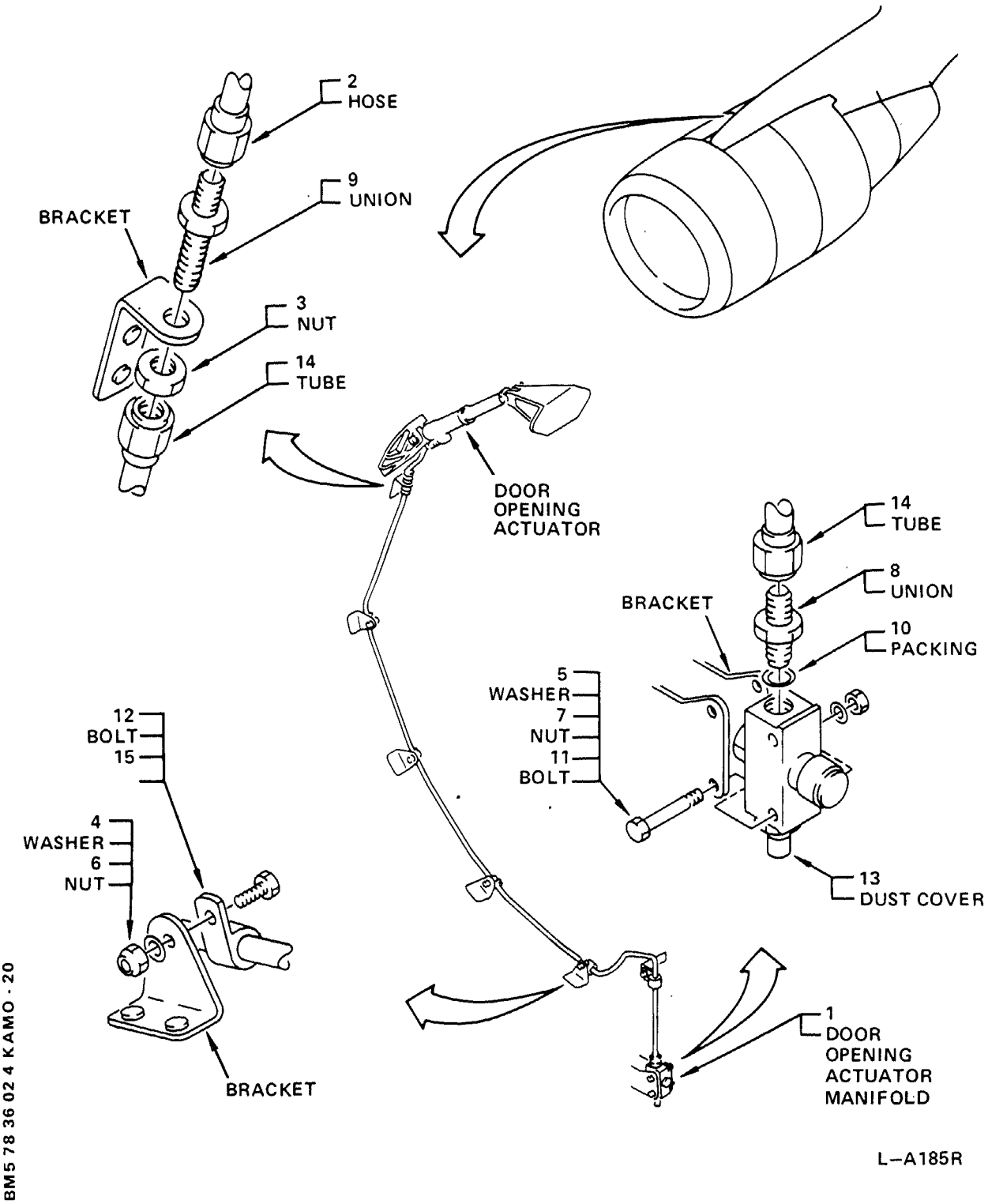
(b) Slowly reduce pump pressure to allow the door to close gradually. Repeat opening and closing door three times to bleed entrapped air from system.

D. Close-Up

(1) Make certain that working area is clear and clean of tools and miscellaneous items of equipment.

(2) Remove access platform.

(3) Remove safety clips and tags and close circuit breakers. Close thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).



Thrust Reverser Door Opening Actuator Manifold
Figure 401

FORWARD CIRCUMFERENTIAL LATCH ASSEMBLY - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
C. Material No.P03-001	Oils (Ref. 70-00-00)
D. Material No.P18-001	Primer (Ref. 70-00-00)
E.	Cotter Pin
R F.	Push-Pull Gage (Model LG-100 or Equivalent)
Referenced Procedures	
- 70-00-00, P. Block 201	Standard Practices - Engine
- 71-13-00, P. Block 301	Cowl Doors
- 78-31-15, P. Block 201	Master and Slave Actuators

2. Procedure

A. Job Set-Up

(1)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (71-13-00, P. Block 301).

(2)Install access platform.

(3)Unlock and release thrust reverser door latches as follows.

(a)Unlock and release aft circumferential door latch.

(b)Unlock and release left or right front circumferential latch.

(c)Open latch access doors at lower center bifurcation area of thrust reverser doors.

(d)Unlock and release forward and aft (bifurcation) tension latches.

(e)Unlock and release center bifurcation tension latch.

B. Removal

Pre SB PW4NAC 71-36

(1)Release hinged latch strap retainers (14 places) by turning stud (2) 1/4 turn counterclockwise. (Ref. Fig. 401)

(2)Remove screws (1), washers (2), nuts (3), and pins (4) attaching master and slave actuators to thrust reverser bulkhead clevis fittings (Ref. Fig. 402).

(3)Disconnect latch at bottom of thrust reverser from latch receiver (Ref. Fig. 401).

(4)Remove clevis pins, washers, and cotter pins attaching left and right circumferential latch assemblies and link assemblies to upper support assembly at top of thrust reverser.

(5)Pull circumferential latch down to remove, moving actuators slightly outboard to allow upper clevis to pass freely under actuators.

(6)Remove bolts, washers, shims, and spacers from upper and lower support assemblies and remove support assemblies from engine (Ref. Fig. 403).

NOTE : Identify shim locations and retain for installation.

End Pre SB PW4NAC 71-36

Post SB PW4NAC 71-36 and 71-116

(1)Release hinged latch strap retainers (14 places) by turning stud (2) 1/4 turn counterclockwise (Ref. Fig. 401).
(2)Remove screws (1), washers (2), nuts (3) and pins (4) attaching master and slave actuators to thrust reverser bulkhead clevis fittings. (Ref. Fig. 402)
(3)Disconnect latch at bottom of thrust reverser from latch receiver. (Ref. Fig. 401)
(4)Remove clevis pins, washers and cotter pins attaching left and right circumferential latch assemblies and link assemblies to upper support assembly at top of thrust reverser.
(5)Pull circumferential latch down to remove, moving actuators slightly outboard to allow upper clevis to pass freely under actuators.
(6)Remove bolts, washers, shims and spacers from lower support assembly and remove lower support assembly from engine (Ref. Fig. 404).
NOTE : Identify shim locations and retain for reinstallation.
(7)Remove bolts, washers, shims, and spacers from two outside upper latch support brackets. Remove bolts, washers, shims, and spacer or PW bracket (Post SB PW4NAC 71-116) from center upper latch support bracket. Remove upper support brackets from engine.

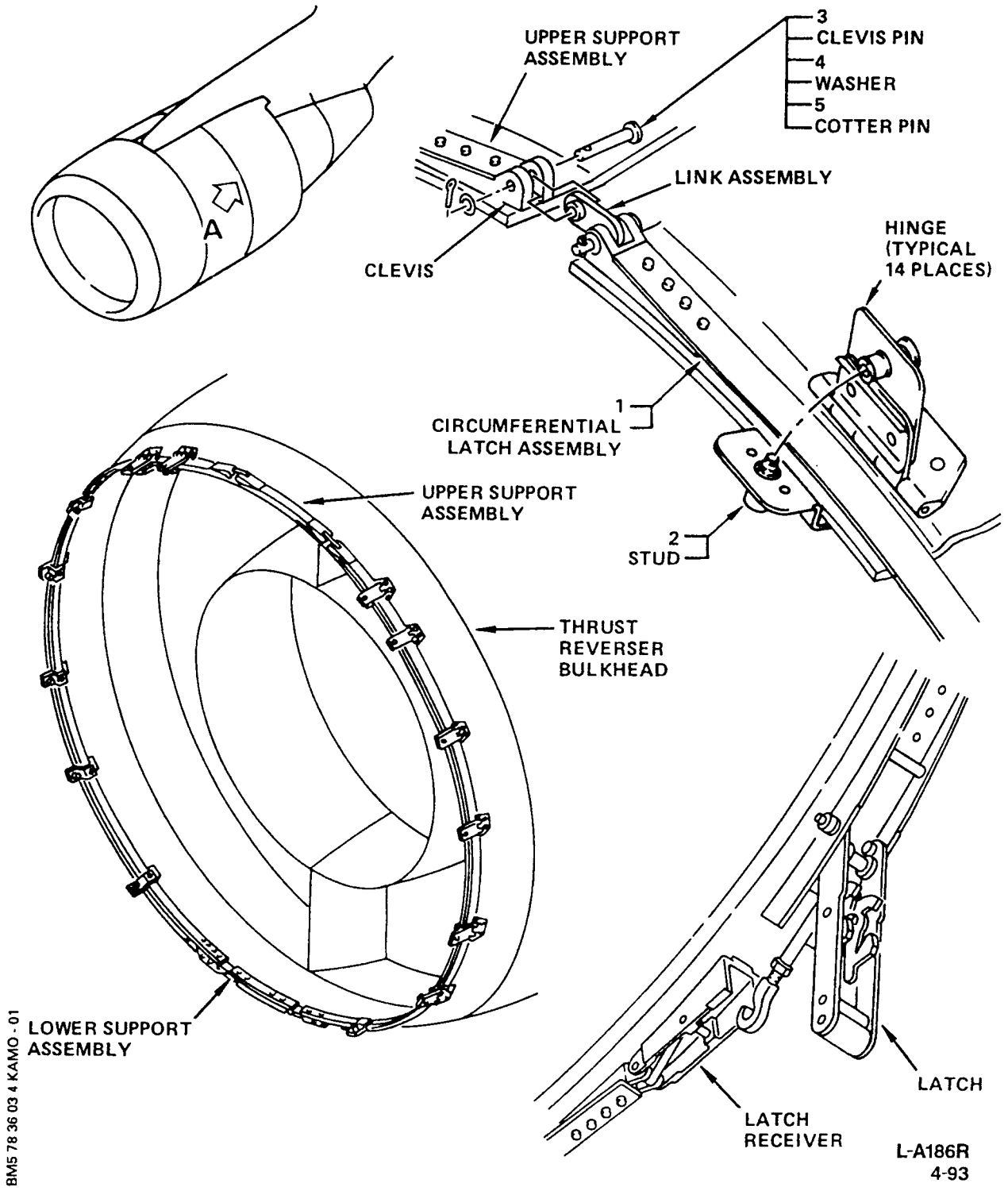
End Post SB PW4NAC 71-36 and 71-116

C. Installation

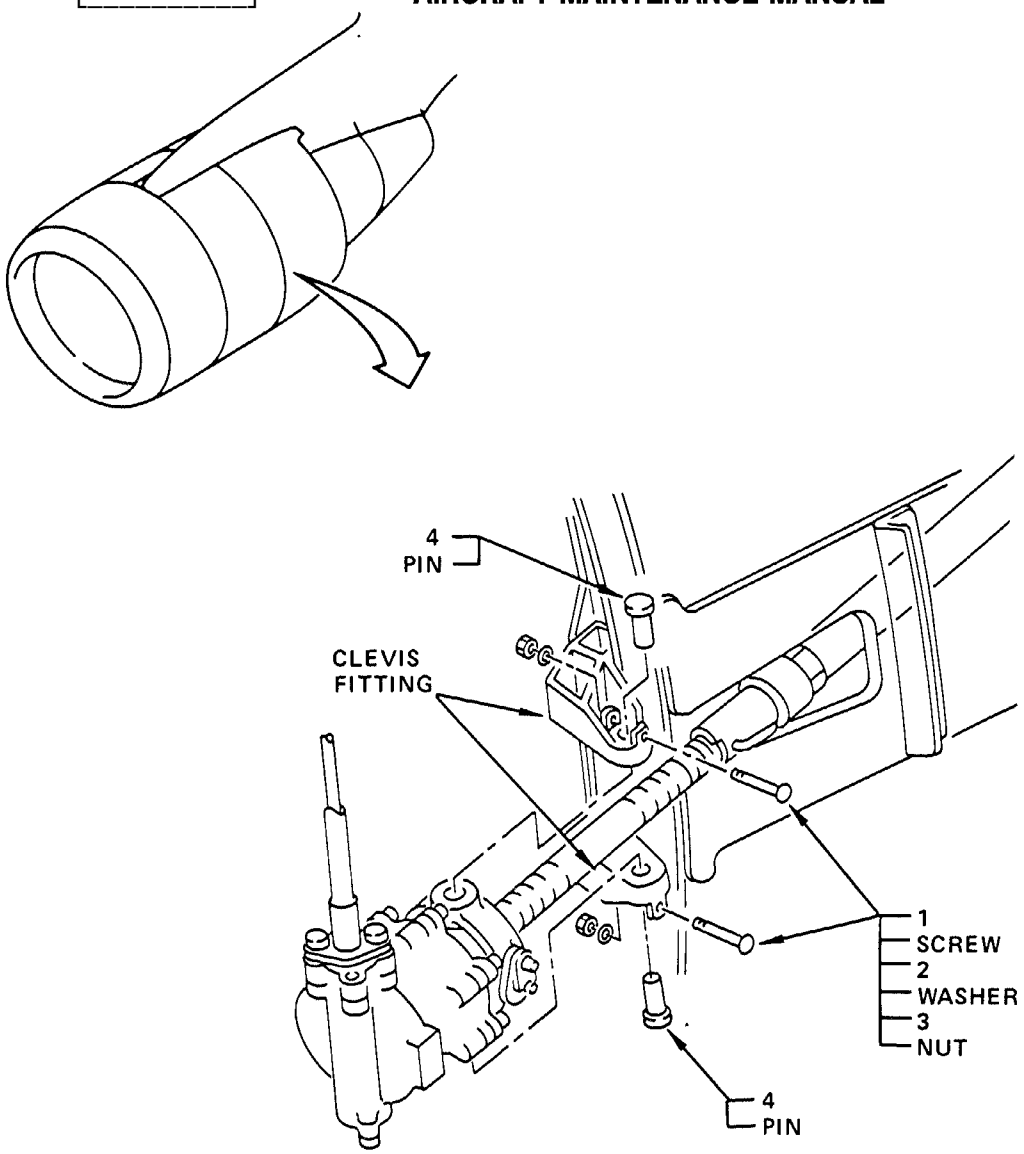
Pre SB PW4NAC 71-36
(1)Peel shims (5) to obtain net fit between upper support assemblies and spacer (6) prior to installing bolts (3).
(2)Lubricate bolts (3) with oil, Material No.P03-001, and coat spacers (6) with primer, Material No.P18-001.
(3)Install upper support assembly (1) and lower support assembly (2) with bolts (3), washers (4), shims (5), and spacers (6). TORQUE bolts to between 35 and 40 lbf.in. (0.39 and 0.45 m.daN).
(4)Slide circumferential latch assembly under actuators working from bottom up and engage hinged retainers. Move actuators slightly outboard to allow latch assembly clevis to pass freely (Ref. Fig. 401).
(5)Install clevis pins (3), washers (4), and cotter pins (5) attaching left and right circumferential latch assemblies and link assemblies to upper support assembly.
(6)Secure hinged latch strap retainers (14 places) on thrust reverser bulkhead by turning stud (2) 1/4 turn clockwise.
(7)Engage latch in receiver at bottom of thrust reverser and close latch.
(8)Install pins (4) in actuators attaching actuators to clevis fittings and secure with screws (1), washers (2), and nuts (3). TORQUE nuts to between 125 and 140 lbf.in. (1.41 and 1.58 m.daN). (Ref. Fig. 402)
(9)Adjust actuators. (Ref. 78-31-15, P. Block 501).
(10)Adjust latch by engaging latch, loosening locknut on hook and rotating hook to obtain a maximum closing force of 45-55 lbs (20.0 - 24.5 daN) measured at tip of handle with push-pull gage. Tighten locknut.

End Pre SB PW4NAC 71-36

Post SB PW4NAC 71-36 and 71-116
(1)Peel shims (5) to obtain net fit between upper support assemblies and spacer (6) or engine bracket (Post SB PW4NAC 71-116) prior to installing



Circumferential Latch
Figure 401



TYPICAL 3 PLACES
EACH SIDE

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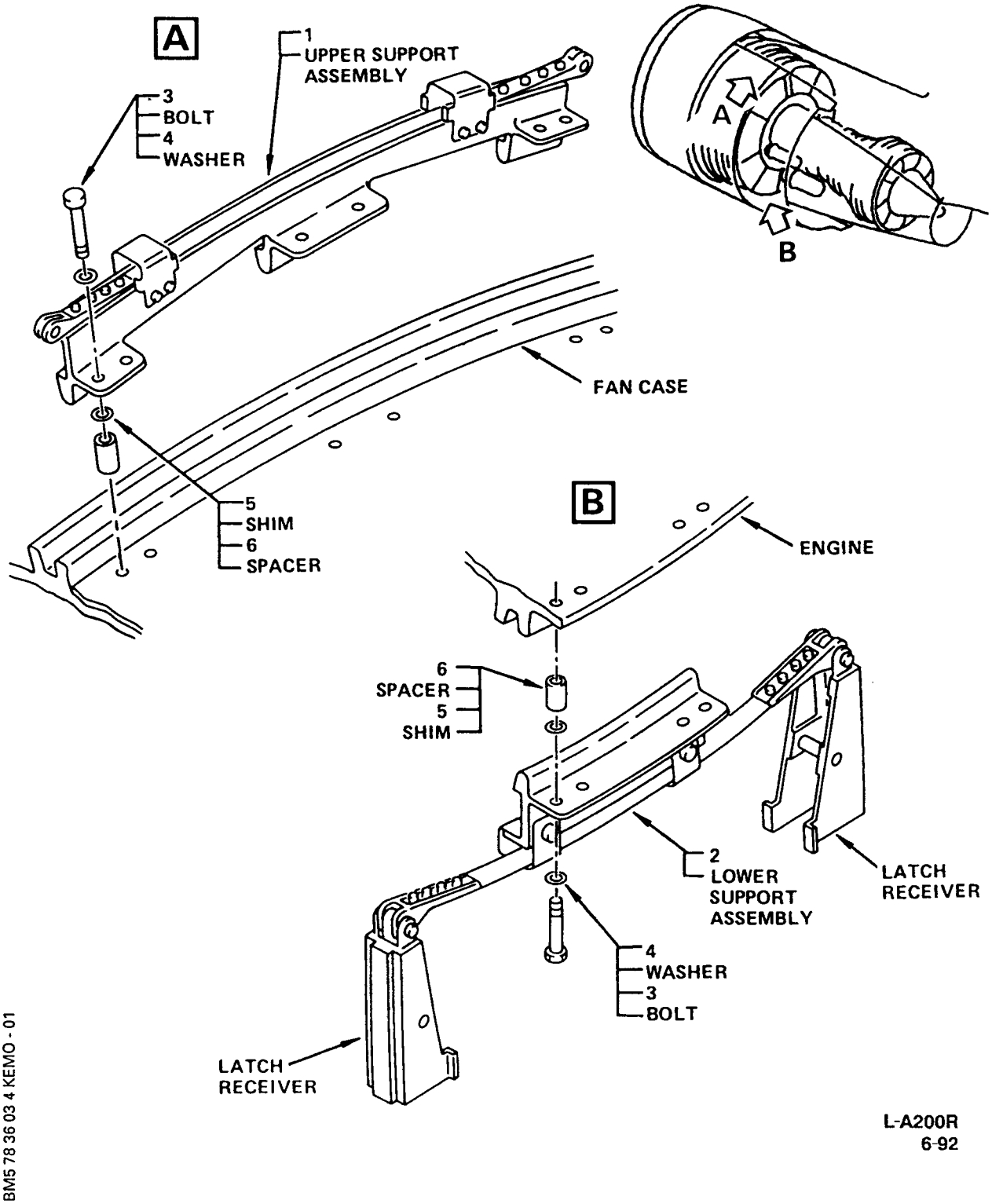
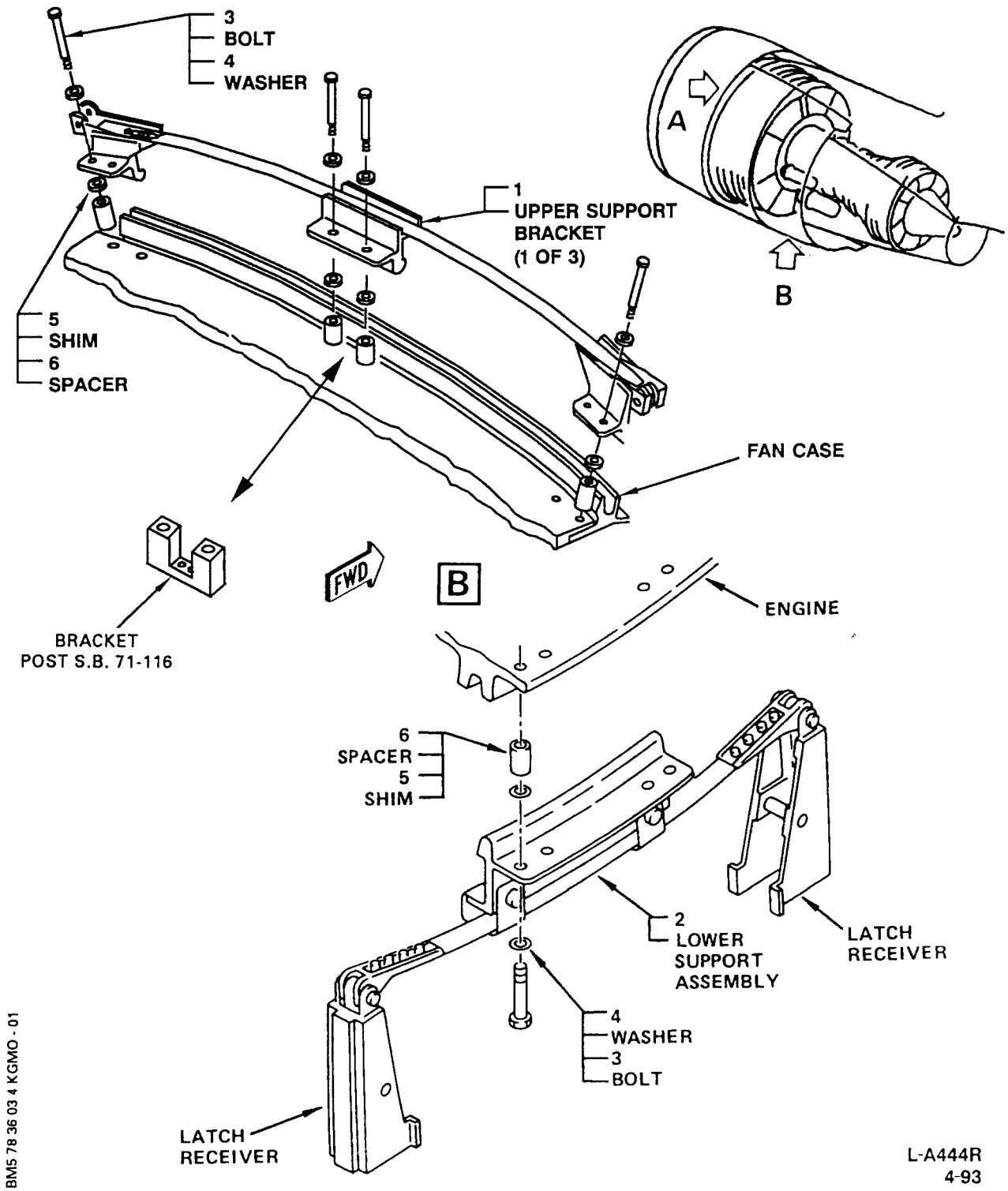
Master and Slave Actuators
Figure 402



Circumferential Latch Support Assemblies
Figure 403



Circumferential Latch Upper Support Brackets
and Lower Support Assembly
Figure 404

bolts (3). (Ref. Fig. 404)
(2)Lubricate bolts (3) with Material No.P03-001, and coat spacers (6) with Material No.P18-001.
(3)Install two outside upper latch support assemblies (1) with bolts (3), washers (4), shims (5) and spacers (6).
(4)Install center upper latch support assembly (1) with bolts (3), washers (4), shims (5), and spacers (6) or PW bracket (Post SB PW4NAC 71-116). TORQUE all upper latch support assembly bolts to between 35 and 40 lbf.in. (0.39 and 0.45 m.daN).
(5)Slide circumferential latch assembly under actuators working from bottom up and engage hinged retainers. Move actuators slightly outboard to allow latch assembly clevis to pass freely. (Ref. Fig. 401)
(6)Install clevis pins (3), washers (4) and cotter pins (5) attaching left and right circumferential latch assemblies and link assemblies to upper support assembly.
(7)Secure hinged latch strap retainers (14 places) on thrust reverser bulkhead by turning stud (2) 1/4 turn clockwise.
(8)Engage latch in receiver at bottom of thrust reverser and close latch.
(9)Install pins (4) in actuators attaching actuators to clevis fittings and secure with screws (1), washers (2) and nuts (3). TORQUE nuts to between 125 and 140 lbf.in. (1.41 and 1.58 m.daN). (Ref. Fig. 402)
(10)Adjust actuators (Ref. 78-31-15, P. Block 501).
(11)Adjust latch by engaging latch, loosening locknut on hook and rotating hook to obtain a maximum closing force of 45 - 55 lbs (200 - 245 N) measured at tip of handle with push-pull gage. Tighten locknut.

End Post SB PW4NAC 71-36 and 71-116

D. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Remove access platform.
(3)Engage and lock thrust reverser latches (Ref. 71-13-00, P. Block 301).
(4)Close fan cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.

FORWARD CIRCUMFERENTIAL LATCH ASSEMBLY - INSPECTION/CHECK

1. Inspect Forward Circumferential Strap and Retaining Clips

A. Equipment and Materials

	ITEM	DESIGNATION
R	(1)	Circuit Breaker Safety Clips
R	(2)	Access Platform
	Referenced Procedure - 71-13-00, P. Block 301	Cowl Doors

B. Job Set-Up
(1)Open, safety and tag circuit breakers for the appropriate engine and open fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.

C. Procedure (Ref. Fig. 601)
(1)Check full length of forward circumferencial strap for proper fit. Check for gouges or other damage.
(2)Check each retainer clip for proper fit over circumferential strap and for tight mounting.

D. Close-Up
(1)Remove access platform.
(2)Close fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.

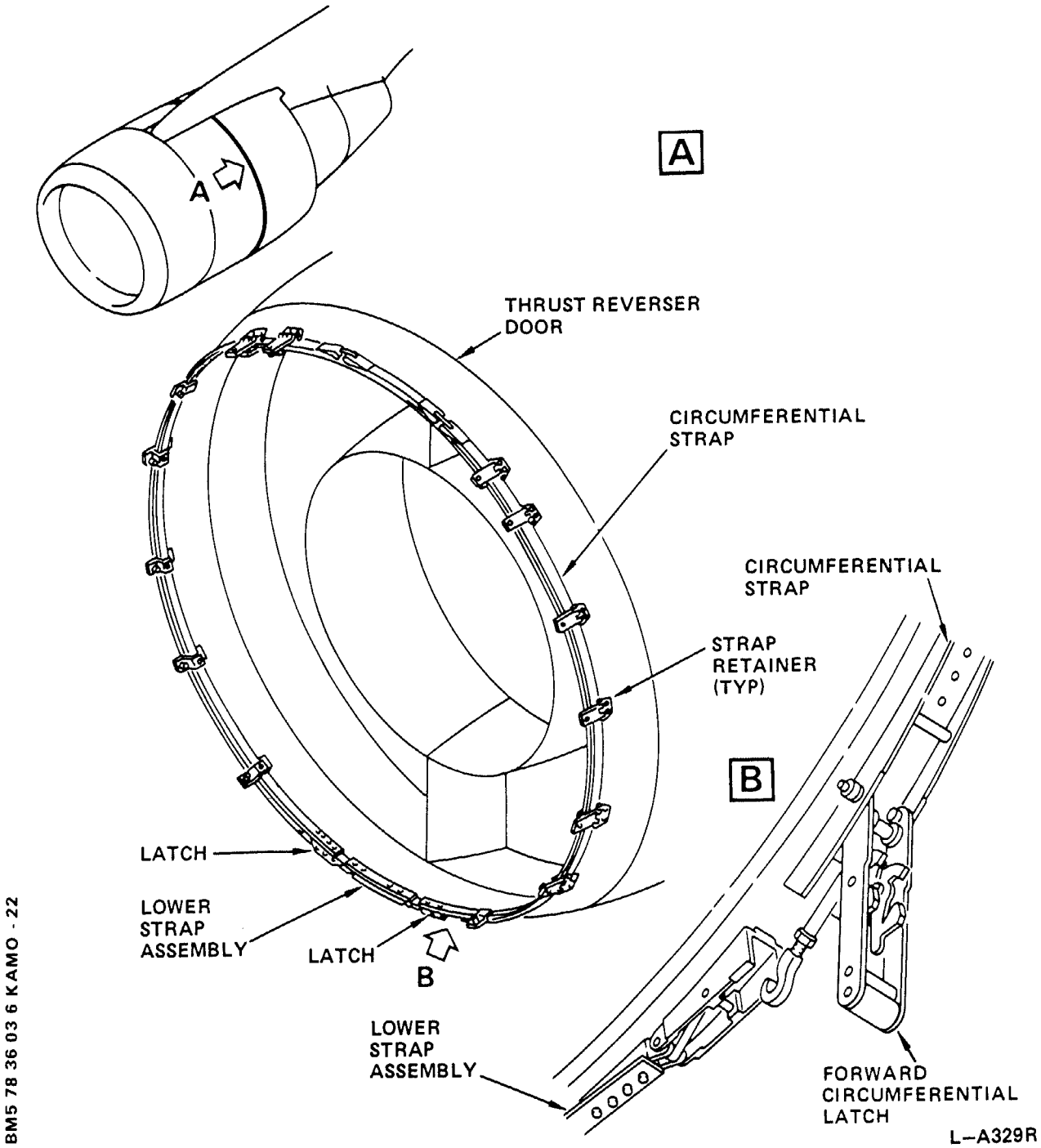
R 2. Inspect and Adjust Forward Circumferential Strap Latches

A. Equipment and Materials

	ITEM	DESIGNATION
	(1)	Circuit Breaker Safety Clips
	(2)	Access Platform
R	(3)	Push-Pull Gage (Model LG-100 or Equivalent)
	Referenced Procedure - 71-13-00, P. Block 301	Cowl Doors

B. Job Set-Up
(1)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Make certain that thrust reverser cowl doors are closed and latched.
(3)Install access platform.

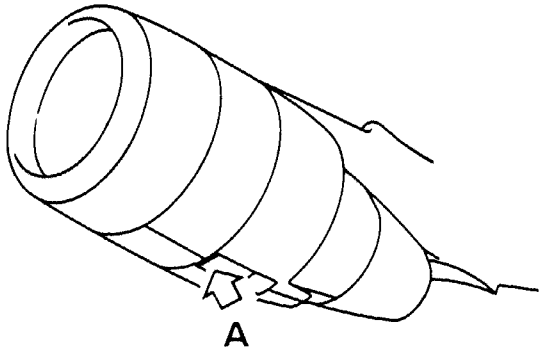
C. Procedure (Ref. Fig. 602)
NOTE : This procedure provides instructions for detailed inspection and adjustment of thrust reverser door forward circumferential strap latches.

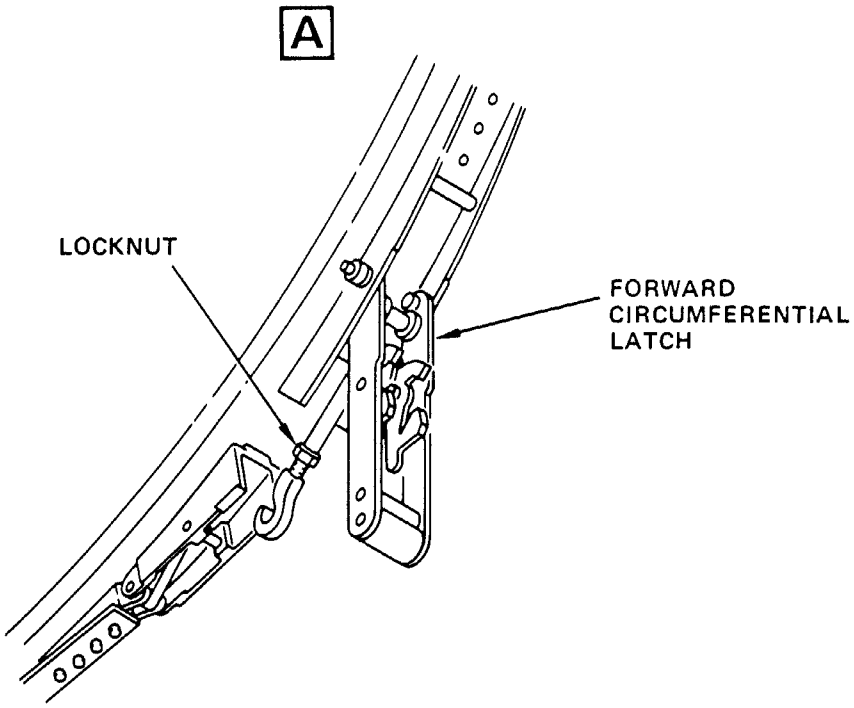


Forward Circumferential Strap and Latches
Figure 601

(1)Open both forward circumferential strap latches together.
(2)Inspect both open latches, looking for excessive wear on latch hook, receiver, hinge bushings, lower strap section, connections of latches to strap and lower strap, latch frame, spring.
(3)Engage both latch hooks and close both latches together.
R (4)Open, but do not unhook, left latch. Then close the open latch, using
R push-pull gage. Closing force is satisfactory if it measures between
R 45-55 lbs (20.02-24.47 daN) at tip of handle. Adjust latch closing
R force, if needed (Ref. Fig. 602).
R (a)To adjust latch closing force, open both latches together. Unhook the
R latch to be adjusted.
R (b)Loosen locknut on hook end of latch and turn hook. Tighten locknut.
R Repeat step (4).
R (5)Perform step (4) on right forward circumferential latch.
R (6)Open, but do not hook, both latches.
R (7)Close both latches together for final closing.

D. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Remove access platform.
(3)Close fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).





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R

Forward Circumferential Latch Adjustment
Figure 602

R AFT CIRCUMFERENTIAL AND THRUST REVERSER COWL LATCH ASSEMBLIES
R - REMOVAL/INSTALLATION

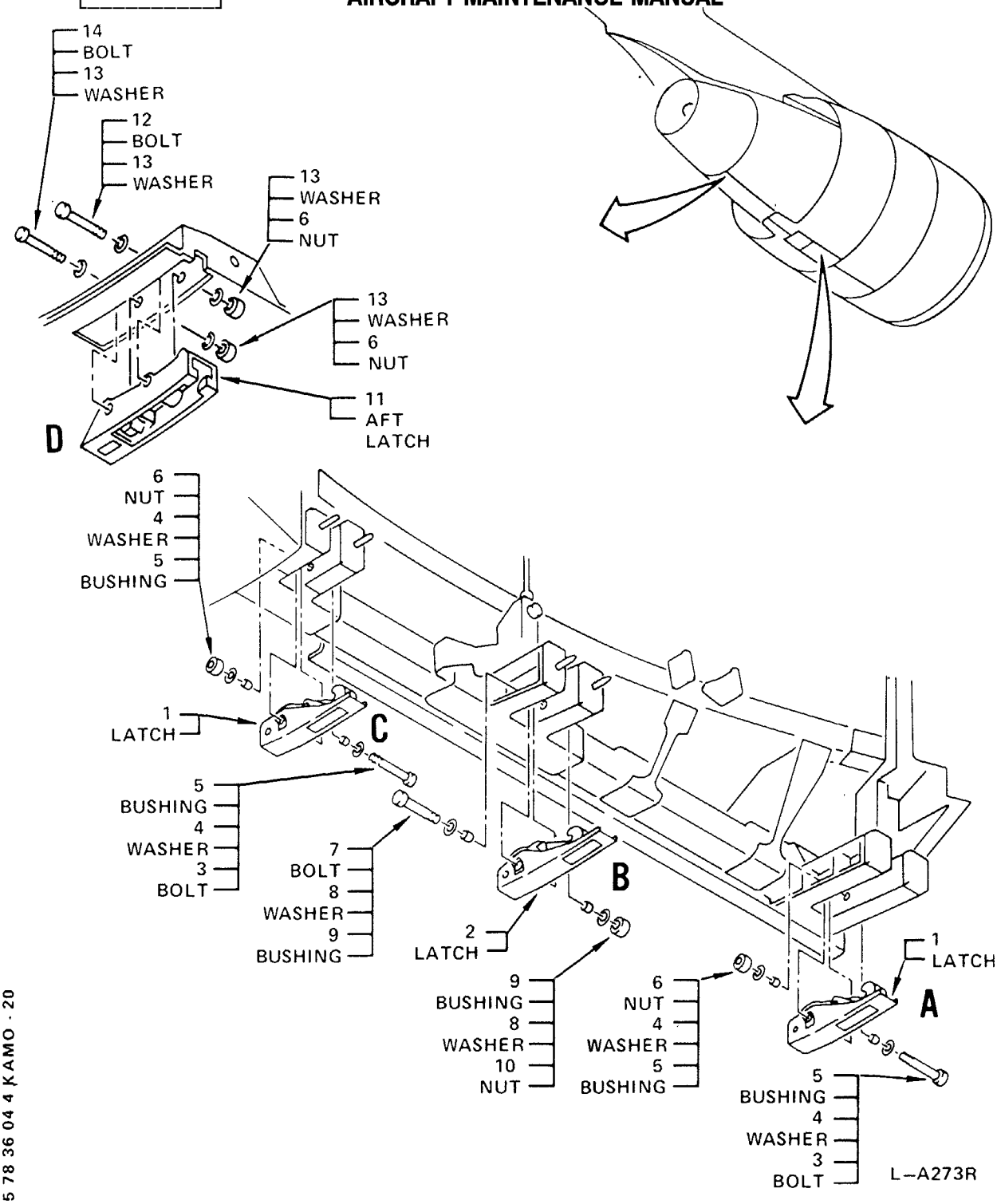
1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Corrosion Resistant Steel Lockwire (MS20995NC51) (Ref. 70-00-00)
C.	Torque Wrench
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 71-13-03, P. Block 501	Fan Thrust Reverser Cowl

2. Procedure

A. Job Set-Up
(1) Open, safety and tag the appropriate circuit breakers and open thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).

B. Removal (Ref. Fig. 401, 402, 403)
(1) At bottom centerline of left thrust reverser door, remove reverser cowl latch assemblies at locations A, B, C and D. (Ref. Fig. 401)
(a) Remove bolts, washers, bushings and nuts attaching latches at locations A, B and C and remove latch assemblies from door.
(b) Remove bolts, washers and nuts attaching latch assembly at location D and remove latch assembly from door.
(2) At bottom centerline of right thrust reverser door, remove eyebolt and housing from location A. (Ref. Fig. 402)
(a) With non-permanent marker, place index mark on side wall of eyebolt assembly to indicate approximate depth of eyebolt.
(b) At housing access opening, remove screw (13) from eyebolt and rotate adjusting nut until eyebolt disengages from housing, and remove eyebolt.
(c) Remove bolts (9) from eyebolt assembly and remove housing.
(3) At bottom centerline of right thrust reverser door, remove eyebolts from locations B and C. (Ref. Fig. 402)
(a) With non-permanent marker, place index mark on side wall of eyebolt assembly to indicate approximate depth of eyebolt.
(b) Rotate adjusting nut until eyebolt disengages from housing and remove eyebolt.
(4) On right thrust reverser door, remove aft latch assembly at location D. (Ref. Fig. 402)
(a) Remove bolts, washers and nuts attaching aft latch assembly to right thrust reverser door and remove latch assembly.
(5) On right and left thrust reverser doors, remove manual load share toggle assemblies. (Ref. Fig. 403)
(a) Remove bolt, washers, shims (laminated washers), bushing and nut from each manual load share toggle assembly, and remove assemblies from each door.



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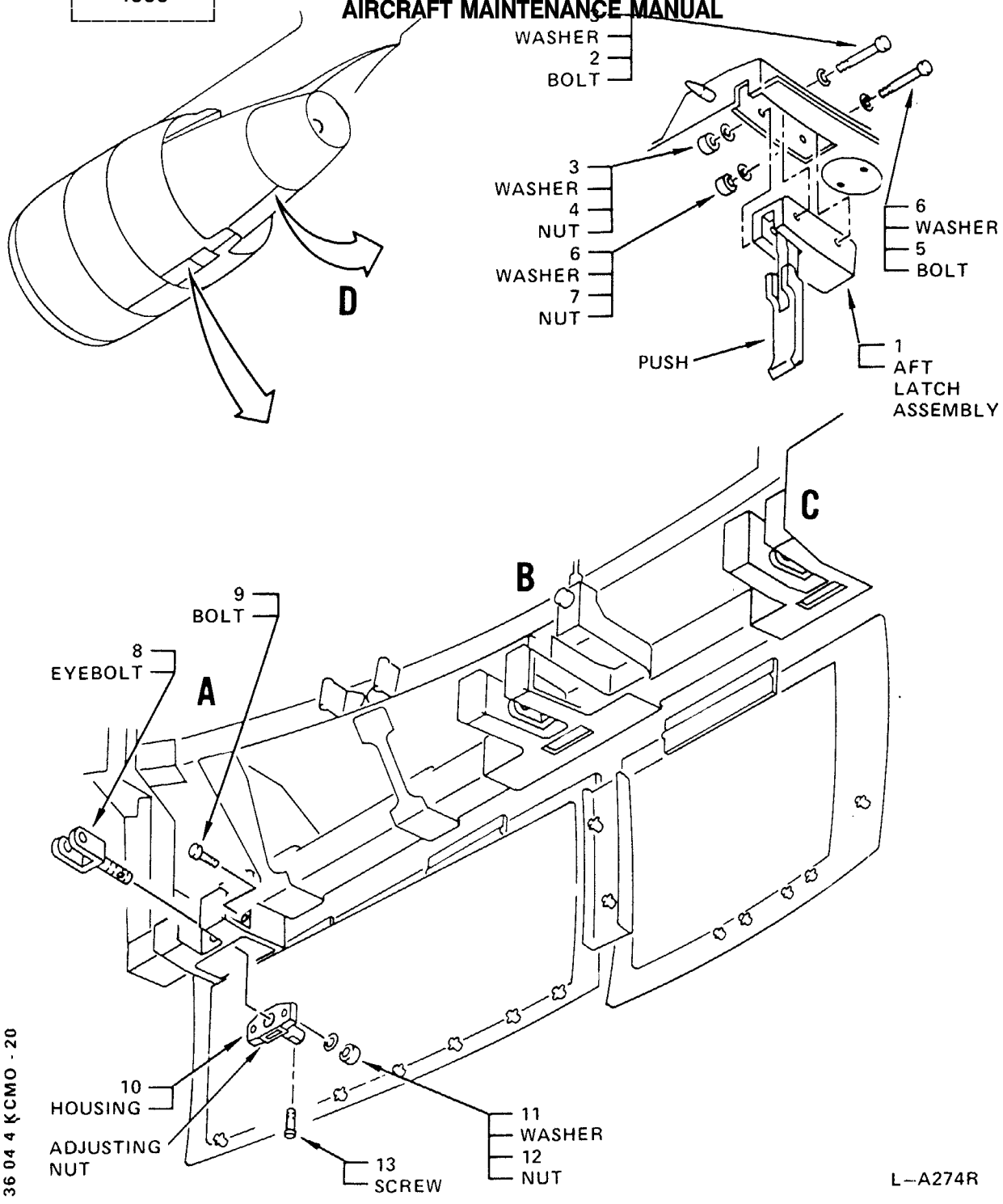
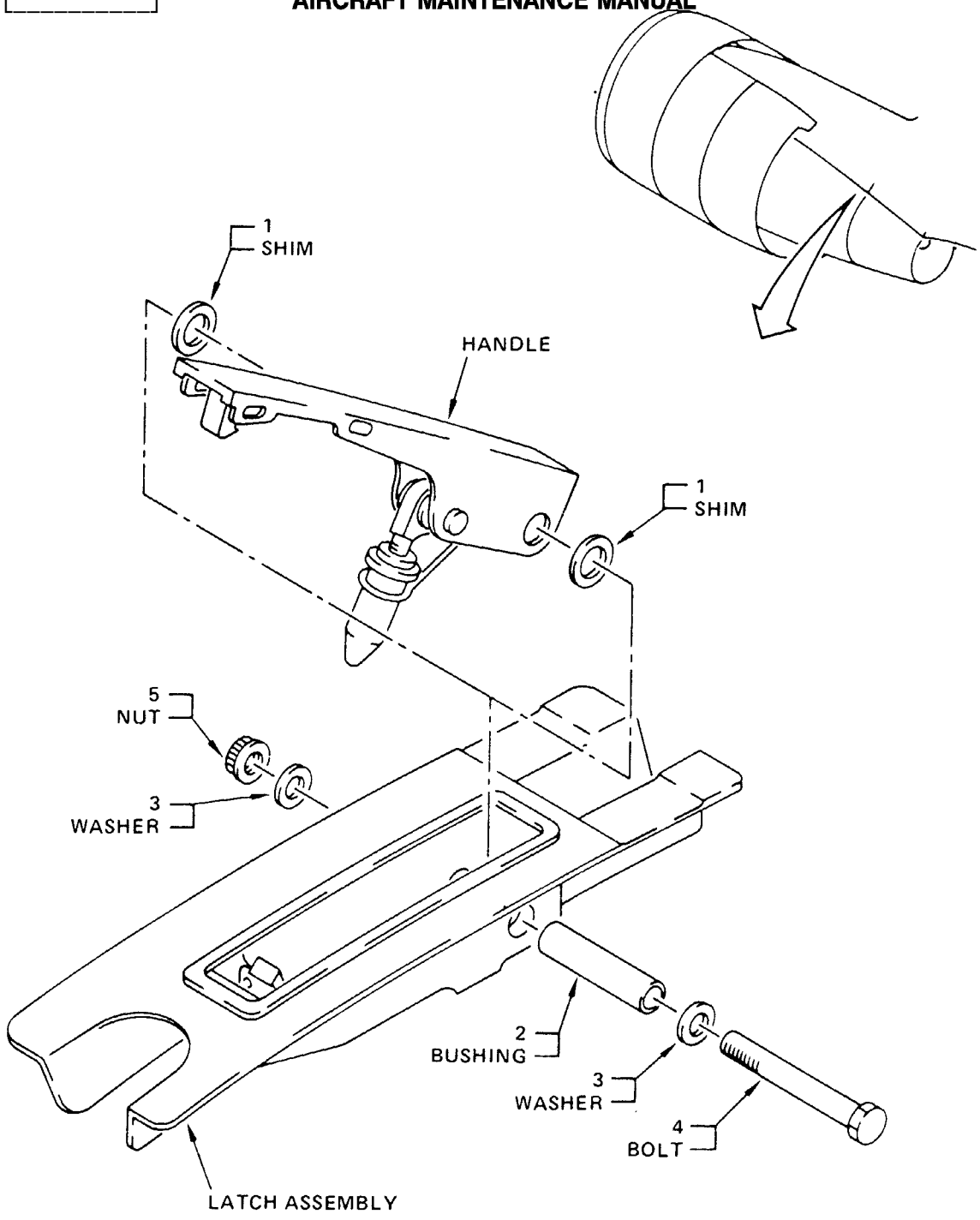
Engine Core Cowl Latch Assemblies Left Side
Figure 401



Engine Core Cowl Latch Assemblies Right Side
Figure 402



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Manual Load Share Toggle
Figure 403

C. Installation (Ref. Fig. 401, 402, 403)
(1)At bottom centerline of left thrust reverser door, install reverser cowl latches at locations A, B, C and D. (Ref. Fig. 401)
(a)Position forward latch (1) at location A or C and attach with bushings (5), bolt (3), washers (4) and nut (6). TORQUE bolt to 140 lbf.in. (1.58 m.daN).
(b)Position center latch (2) at location B, and attach with bushings (9), bolt (7), washers (8), and nut (10). TORQUE bolt to 500 lbf.in. (5.65 m.daN).
(c)Position aft latch (11) at location D, and attach with bolts (12) and (14), washers (13) and nut (6). TORQUE bolt (12) to 140 lbf.in. (1.58 m.daN). TORQUE bolt (14) to 70 lbf.in. (0.79 m.daN). Wirelock bolt (12) to bolt (14).
(2)At bottom centerline of right thrust reverser door, install eyebolt and housing at location A. (Ref. Fig. 402)
(a)Position housing (10) and attach with bolts (9), washers (11) and nuts (12). TORQUE bolts to 25 lbf.in. (0.28 m.daN).
(b)Install eyebolt (8) to housing by threading adjusting nut onto eyebolt until flush with index mark made during removal.
NOTE : If no index mark was made during removal, install eyebolt to an approximate depth and align when all latches are installed.
(c)Install screw (13) through housing access opening into threaded hole in eyebolt shaft. TORQUE to 25 lbf.in. (0.28 m.daN).
(3)At bottom centerline of right thrust reverser door, install eyebolts at locations, B and C.
(a)Hold eyebolt in position and turn adjusting nut until eyebolt is adjusted to index mark made during removal or to approximate depth.
(4)On right thrust reverser door, install aft circumferential latch assembly at location D. (Ref. Fig. 402)
(a)Position marked latch assembly (1) and attach with bolt (2), washers (3), nut (4) ; and bolt (5), washers (6), and nut (7). TORQUE both bolts to 140 lbf.in. (1.58 m.daN).
(b)Wirelock bolt (2) to bolt (5).
(5)On right and left thrust reverser doors, install manual load share toggle assemblies. (Ref. Fig. 403)
(a)Position each toggle assembly, and attach with bolt (4), washers (3), shims (laminated washers) (1), bushing (2) and nut (5). TORQUE bolt to between 50 and 60 lbf.in. (0.56 and 0.67 m.daN).
(6)Adjust latch (Ref. 71-13-03, P. Block 501).

D. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close thrust reverser cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.

AFT CIRCUMFERENTIAL AND THRUST REVERSER COWL LATCH ASSEMBLY - INSPECTION/CHECK

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Wrench, Hex-Drive Male, 5/32 in.
R C.	Push-Pull Gage (Model LG-100 or Equivalent)
D.	Magnify Glass, 10X
E.	Access Platform
Referenced Procedure - 71-13-00, P. Block 301	Cowl Doors

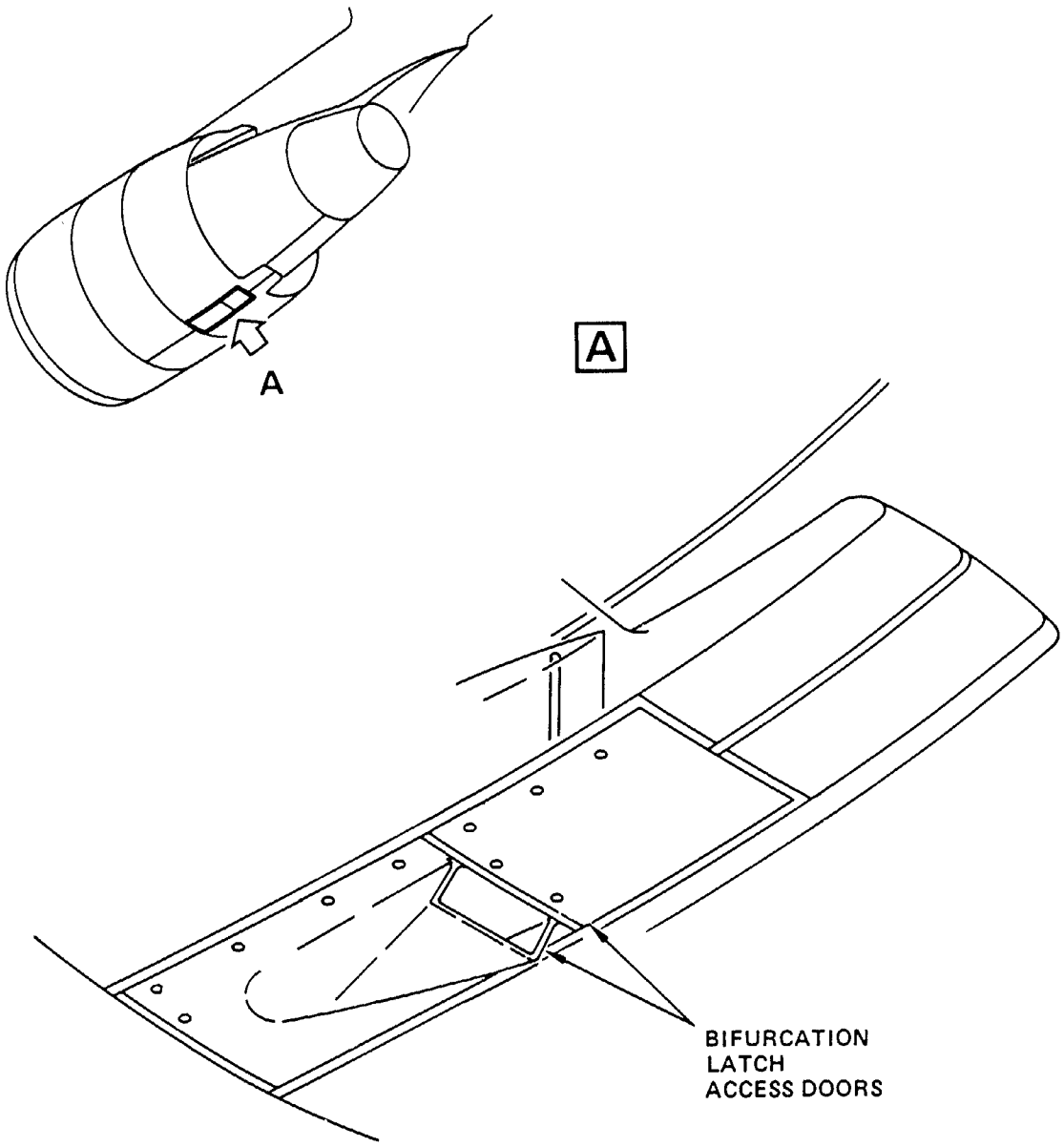
2. Procedure

A. Job Set-Up
(1)Open, safety and tag circuit breakers for the appropriate engine (Ref. 71-13-00, P. Block 301).
(2)Install access platform.

B. Inspect Thrust Reverser Door Bifurcation Latches.
NOTE : This procedure provides instructions for detailed inspection and adjustment of thrust reverser door bifurcation latches.
(1)Make certain that thrust reverser doors are closed and latched.
(2)Open two bifurcation latch access doors, bottom centerline of thrust reverser doors. (Ref. Fig. 601)
(3)Open center bifurcation latch. (Ref. Fig. 602)
(4)Wipe the center bifurcation latch clean with a clean, dry cloth.
(5)Inspect opened latch, looking for excessive wear on latch hook, receiver, hinge bushings, latch frame, spring.
(6)Inspect the latch hook and the receiver for cracks with a 10X magnifying glass. No cracks are allowed.
(Reference SB PW4NAC 78-113).
(7)Engage hook and close latch using push-pull gage. Closing force is satisfactory if it measures 50 - 60 lbf. (22.24 - 26.69 daN) at tip of handle. Adjust latch closing force, if needed (Ref. Fig. 603).
(a)To adjust latch closing force, open latch to be adjusted.
(b)Using a 5/32 in. hex wrench, turn the adjusting nut in the slot on the engagement end (right door) of the latch needing adjusting - counterclockwise to increase tension, clockwise to decrease tension. Repeat step (7).
(8)Open aft bifurcation latch.
(9)Wipe the aft bifurcation latch clean with a clean, dry cloth.
(10)Inspect opened latch, looking for excessive wear on latch hook, receiver, hinge bushings, latch frame, spring.
(11)Inspect the latch hook and the receiver for cracks with a 10X magnifying glass. No cracks are allowed.
(Reference SB PW4NAC 78-113).
(12)Engage hook and close latch using push-pull gage. Closing force is

R satisfactory if it measures 50 - 60 lbf. (22.24 - 26.69 daN) at tip of handle. Adjust latch closing force, if needed (Ref. Fig. 603).
R (a)To adjust latch closing force, open latch to be adjusted.
R (b)Using a 5/32 in. hex wrench, turn the adjusting nut in the slot on the engagement end (right door) of the latch needing adjusting - counterclockwise to increase tension, clockwise to decrease tension. Repeat step (12).
R (13)Open forward bifurcation latch.
R (14)Wipe the forward bifurcation latch clean with a clean, dry cloth.
R (15)Inspect opened latch, looking for excessive wear on latch hook, receiver, hinge bushings, latch frame, spring.
R (16)Inspect the latch hook and the receiver for cracks with a 10X magnifying glass. No cracks are allowed.
R (Reference SB PW4NAC 78-113).
R (17)Engage hook and close latch using push-pull gage. Closing force is satisfactory if it measures 50 - 60 lbf. (22.24 - 26.69 daN) at tip of handle. Adjust latch closing force, if needed (Ref. Fig. 603).
R (a)To adjust latch closing force, open latch to be adjusted.
R (b)Using a 5/32 in. hex wrench, turn the adjusting nut in the slot on the engagement end (right door) of the latch needing adjusting - counterclockwise to increase tension, clockwise to decrease tension. Repeat step (17).
R (18)Close two bifurcation latch access doors, bottom centerline of thrust reverser doors.

C. Inspect and Adjust Aft Circumferential Strap Latch and Load Share Toggle Latches (Ref. Fig. 604, 605, 606).
(1)Make certain that thrust reverser doors are closed and are latched.
(2)Manually open left load share toggle latch.
CAUTION : IF THE LEFT AND/OR RIGHT LATCH HANDLE CANNOT BE RELEASED MANUALLY, DO NOT PRY OPEN THE LATCH HANDLE. DAMAGE TO THE LATCH ASSEMBLY WILL OCCUR.
(a)Unlock left latch by sliding a small rod through hole in latch handle circumferentially downward to release handle latch (Ref. Fig. 605).
(b)If the left latch handle cannot be realeased manually, unlock right latch by sliding a small rod through hole in latch handle circumferentially downward to release handle latch (Ref. Fig. 605).
(c)In the event that one of the latch handles still cannot be released manually, unlock and open the thrust reverser (Ref. 71-13-00, P. Block 301).
(d)When both of the latch handles are open, close the thrust reverser (Ref. 71-13-00, P. Block 301).
(3)Inspect load share toggle latch (Ref. Fig. 604).
(a)Look through open toggle latch, check condition of toggle, toggle receiver, toggle handle with two guide pins, toggle latch frame.
NOTE : Wear on the latch handle guide pins and/or toggle pin usually indicates a loss in latch closing force.
(b)Examine the large latch spring that is centered around the latch handle upper pivot bushing (Ref. Fig. 604).
(c)Verify that the spring is properly installed with the protruding spring leg rises from between the pivot bushing and the toggle pin.



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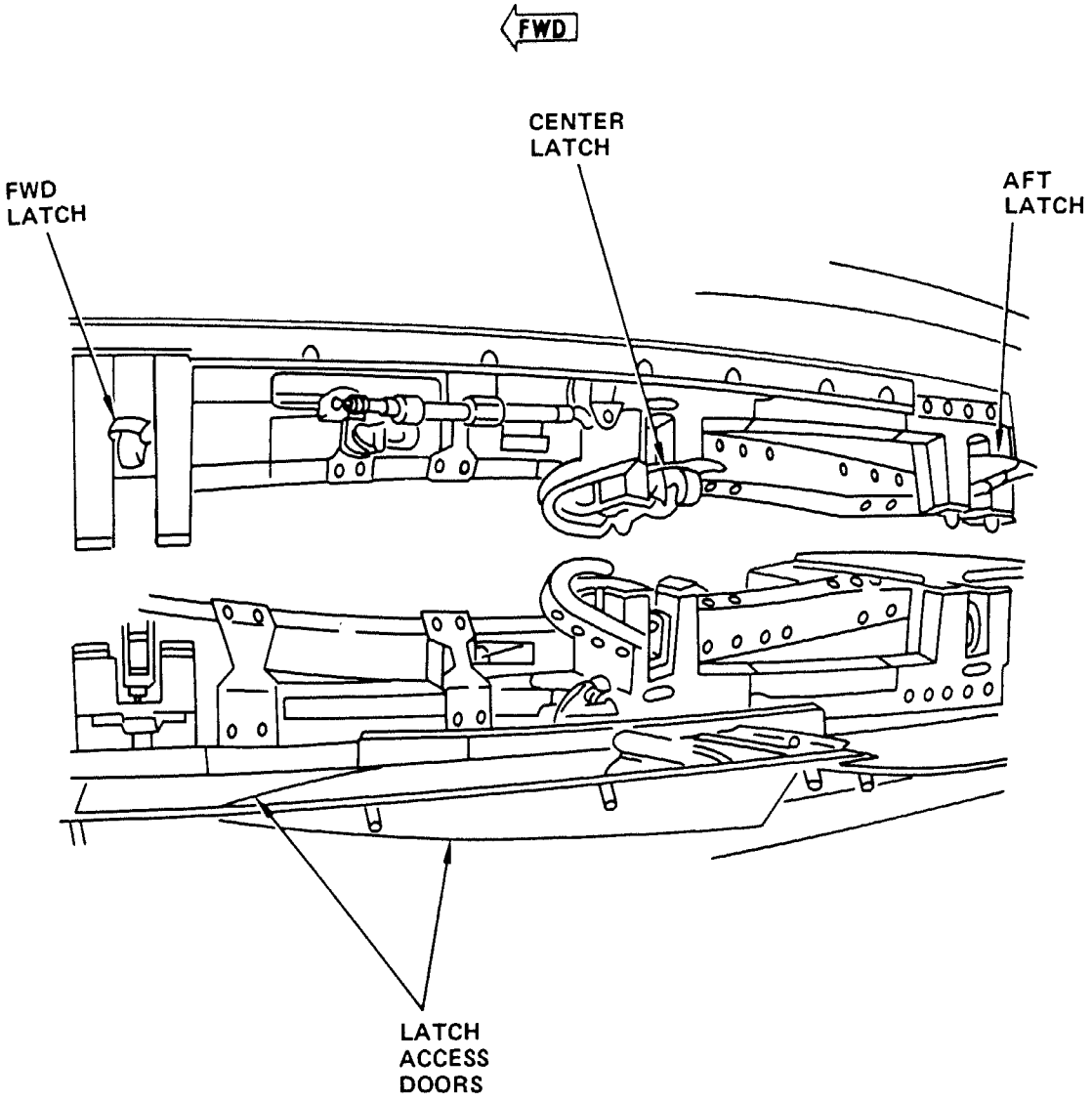
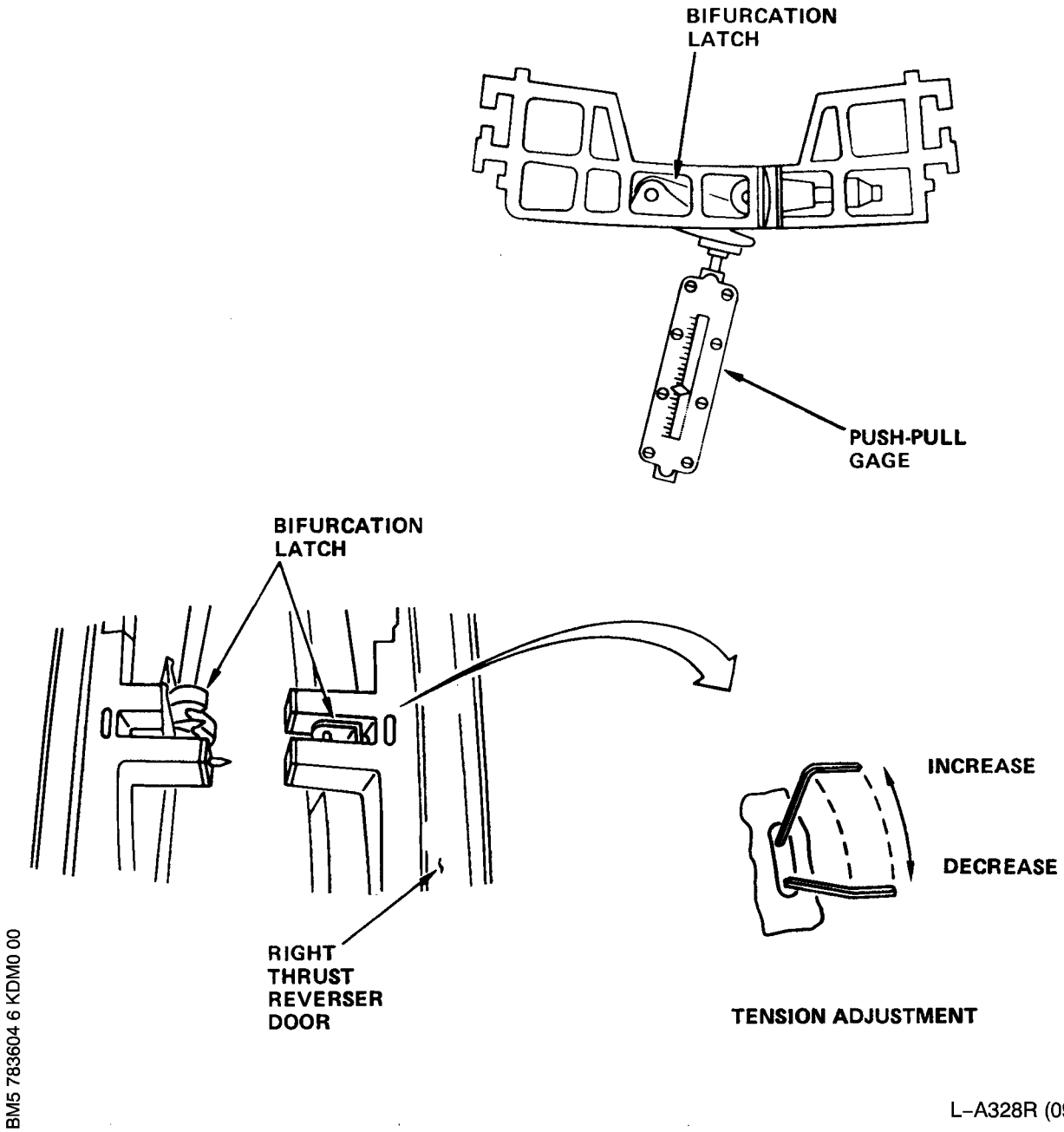
Engine Core Cowl Latch Access Doors
Figure 601



Engine Core Cowl Latch Assembly
Figure 602



Engine Core Cowl Latch Tension Adjustment
Figure 603

R

NOTE : There is the possibility of an incorrect installation where the spring is reversed, and the spring leg is protruding from in front of (above) the pivot bushing. This can result in the pushing of the toggle pin away from the receptacle at closing, such that the latch can be closed with properly engaging the toggle pin.

(d)(PRE SB PW4NAC 78-12) Examine the toggle pin tension spring for condition.

NOTE : Pre SB PW4NAC 78-12 spring configuration used on spring. POST SB PW4NAC 78-12 configuration is composed of two springs to avoid single spring relaxation, which resulted in improper pin alignment with receptacle. Such misalignment made latch closing difficult, and the excessive force required to close the latch meant damage to the handle guide pins, toggle pin, and latch frame. The two (2) spring configuration is the preferred configuration.

NOTE : A toggle latch pin handle found popped open upon initial thrust reverser inspection would indicate insufficient latch tension, or improper toggle pin position at last door closure.

(e)(POST SB PW4NAC 78-12) Examine the two toggle pin tension springs.

CAUTION : ENSURE STRONG SNAP IS FELT INDICATING PROPER CLOSING OF TOGGLE LATCH.

(4)Engage load share toggle latch and close using push-pull gage. Closing force is satisfactory if between 30 and 50 lbf (13.34 and 22.24 daN) measured at tip of handle. Adjust latch closing force, if needed (Ref. Fig. 606).

(a)To adjust latch closing force, open latch to be adjusted.

(b)Loosen locknut on toggle latch pin and turn toggle pin. Tighten locknut.

(c)Repeat step (4) until latch closing force is between 30 and 50 lbf (13.34 and 22.24 daN). Carefully lockwire locknut. Close toggle latch.

(5)Perform steps (2) through (4) for right load share toggle latch.

(6)Open both load share toggle latches and close them together for the final closing.

(7)Open aft circumferential latch.

(8)Inspect latch for signs of wear on latch hook, receiver, hinge bushings, latch frame, spring.

(9)Ensure two load share toggle latches are closed.

(10)Engage aft circumferential latch and close using push-pull gage. Closing force is satisfactory if between 70 and 80 lbs. (311.4 and 355.9 N) measured a quarter inch from end of latch handle. Adjust latch closing force, if needed.

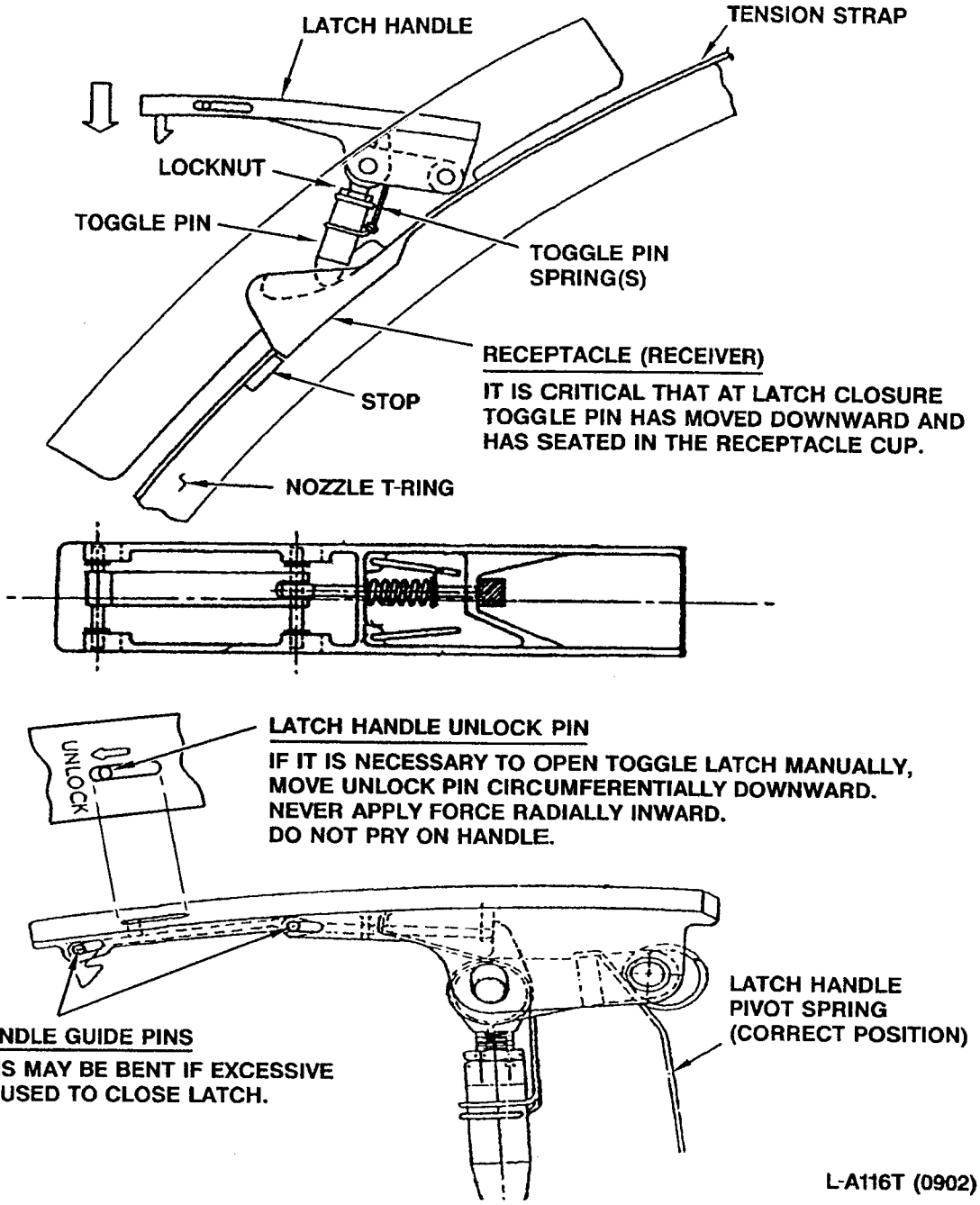
(a)To adjust latch closing force, open aft circumferential latch.

(b)Remove small access panel at right end of aft circumferential latch. Insert 0.156 in. (3.96 mm) hex wrench into access opening and rotate adjustment screw. Repeat steps (8) and (9).

(11)Reinstall adjustment access panel.

D. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.


LATCH HANDLE
TENSION STRAP
LOCKNUT
TOGGLE PIN
TOGGLE PIN SPRING(S)
RECEPTACLE (RECEIVER)
IT IS CRITICAL THAT AT LATCH CLOSURE TOGGLE PIN HAS MOVED DOWNWARD AND HAS SEATED IN THE RECEPTACLE CUP.
STOP
NOZZLE T-RING
UNLOCK
LATCH HANDLE UNLOCK PIN
IF IT IS NECESSARY TO OPEN TOGGLE LATCH MANUALLY, MOVE UNLOCK PIN CIRCUMFERENTIALLY DOWNWARD.
NEVER APPLY FORCE RADIALLY INWARD.
DO NOT PRY ON HANDLE.
LATCH HANDLE PIVOT SPRING (CORRECT POSITION)
LATCH HANDLE GUIDE PINS
GUIDE PINS MAY BE BENT IF EXCESSIVE FORCE IS USED TO CLOSE LATCH.
L-A116T (0902)

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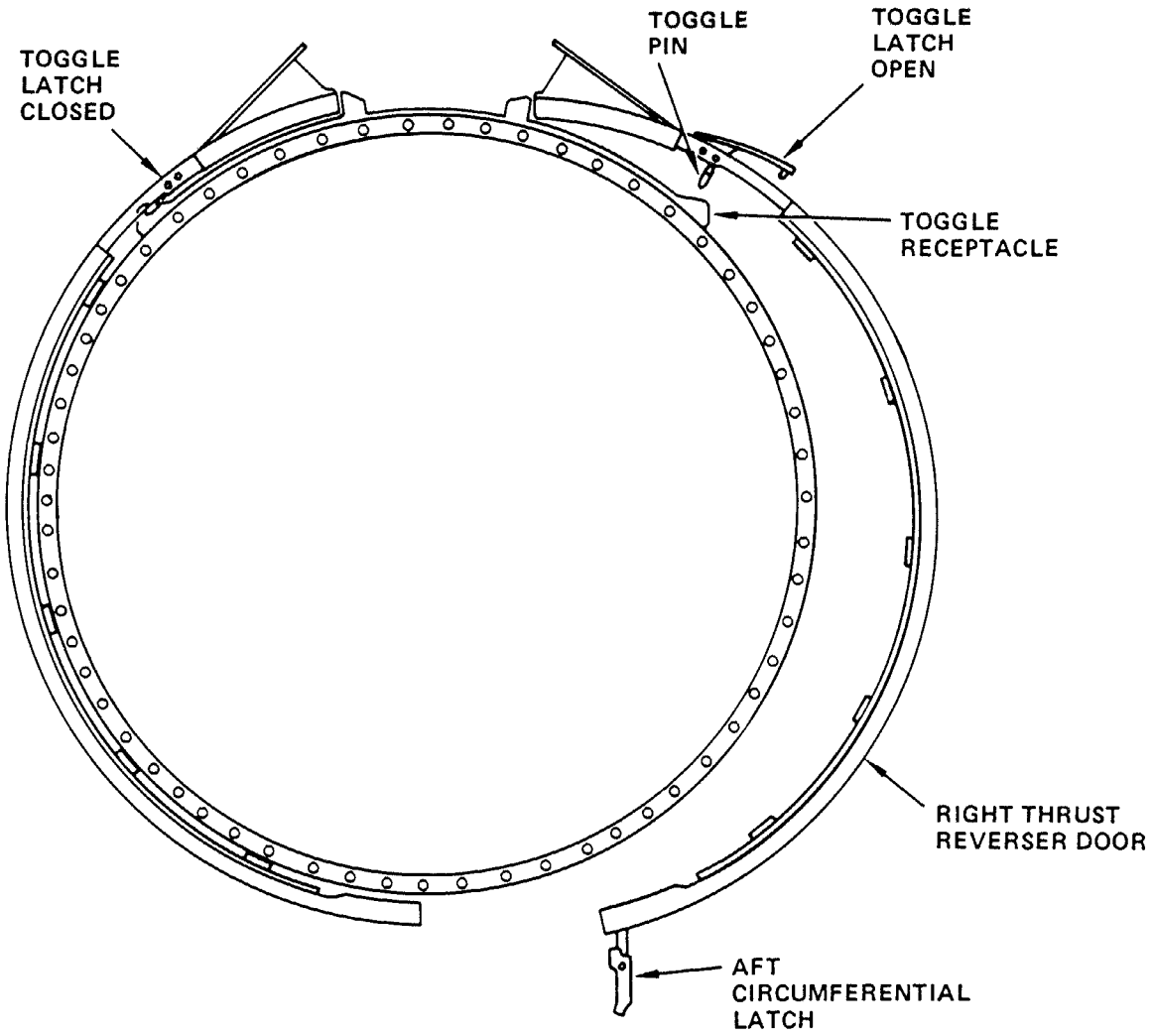
Toggle Latch
Figure 604



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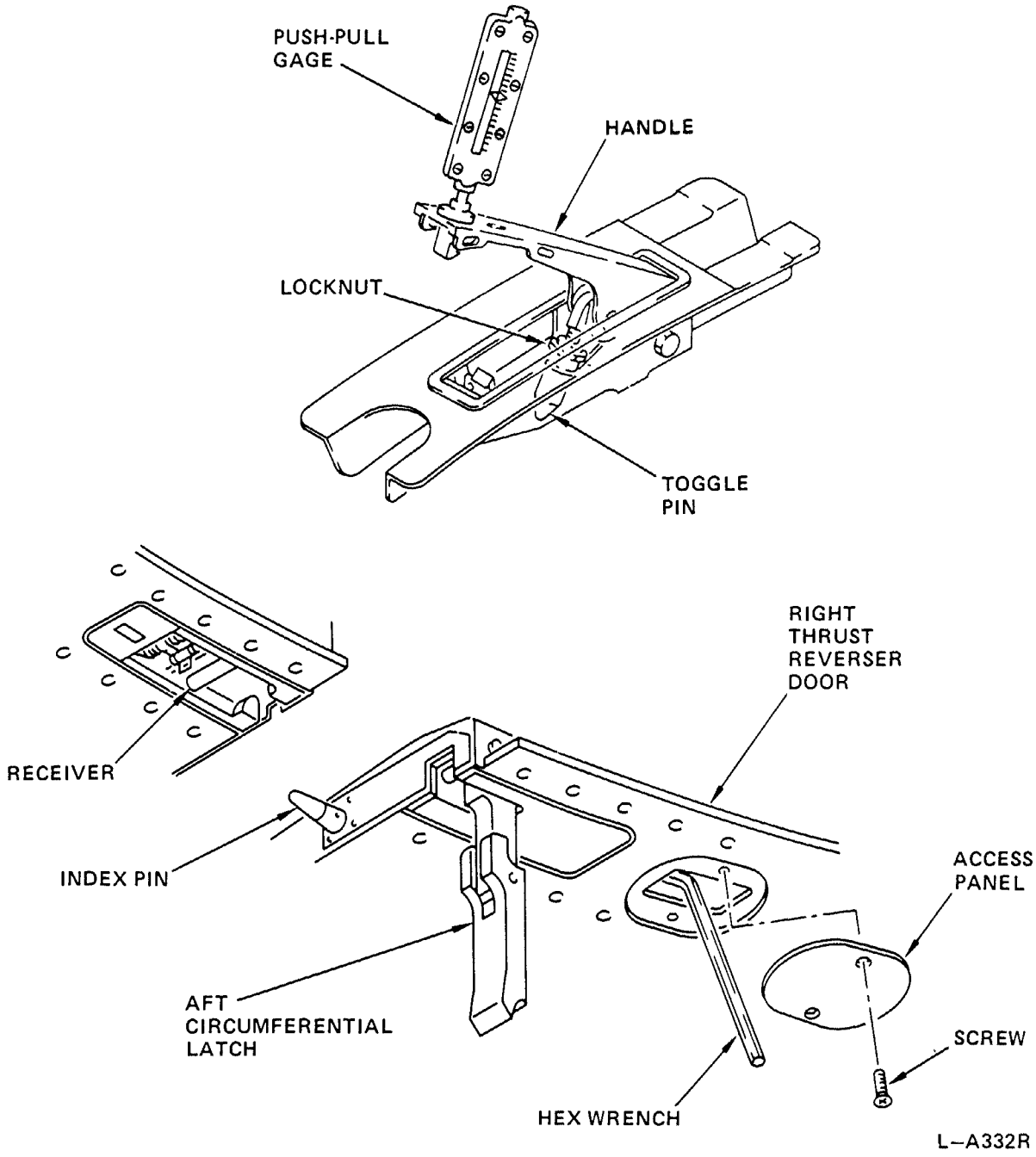
Thrust Reverser Door Aft Circumferential Latch
and Load Share Toggle Latches
Figure 605



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Thrust Reverser Aft Circumferential Latch
and Load Share Toggle Latch Adjustment
Figure 606

(2)Remove access platform.
(3)Remove safety clips and tags and close circuit breakers for the appropriate engine (Ref. 71-13-00, P. Block 301).

THRUST REVERSER DOOR HOLD-OPEN RODS - SERVICING

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B. 98A71103250000	Sleeve - Cowl Door Opening Acutator
C.	Access Platform
D. Material No.P06-004	Lubricants (Ref. 70-00-00)
Referenced Procedures	
- 70-00-00, P. Block 201	Engine - Standard Practices
- 71-13-00, P. Block 301	Cowl Doors

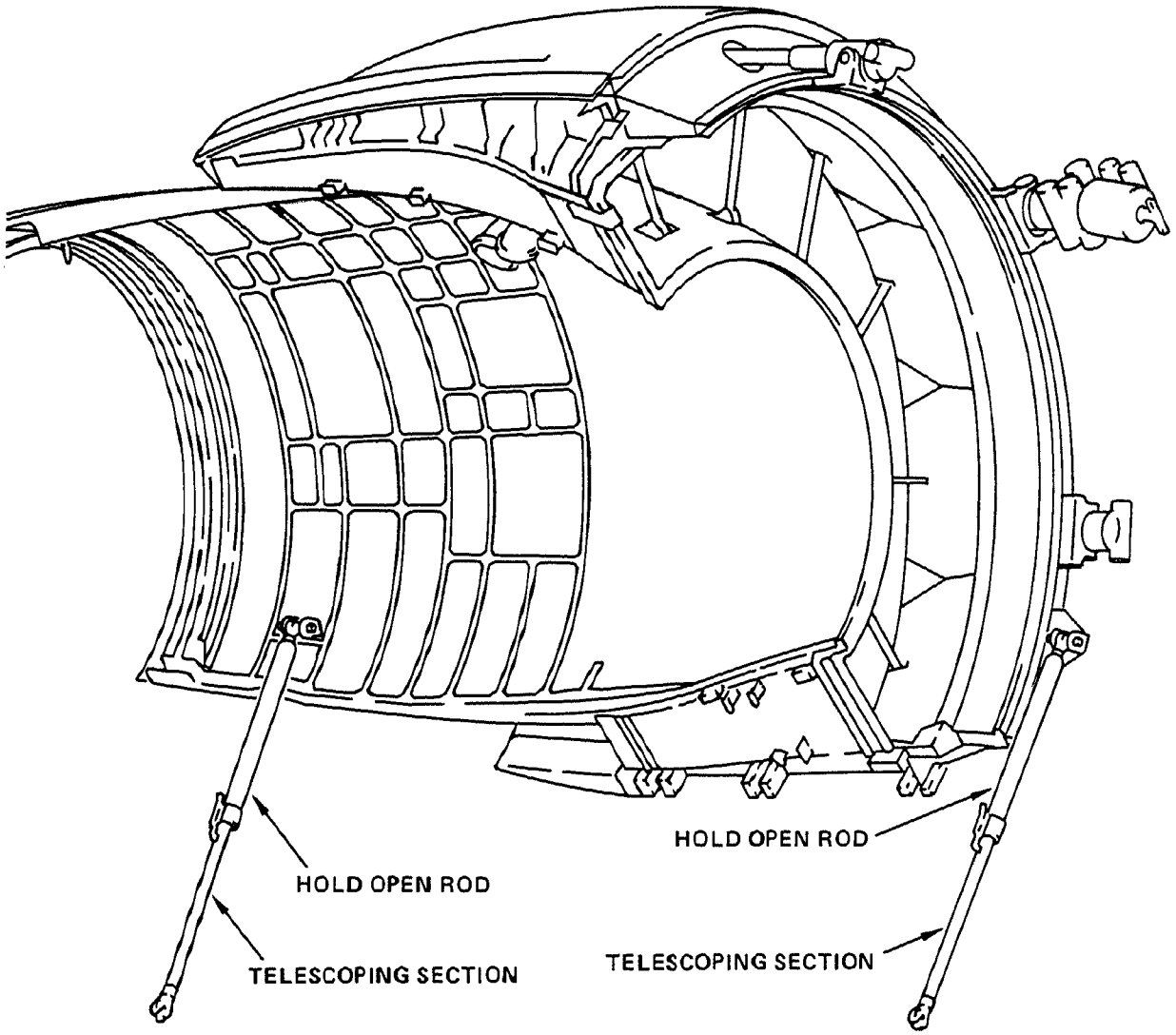
2. Procedure

A. Job Set Up
(1)Open, safety and tag the appropriate circuit breakers, and open fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install appropriate thrust reverser door support tool 98A71103250000 to pylon and door.

B. Clean Thrust Reverser Door Hold-Open Rods (Ref. Fig. 301)
Clean
(1)Release hold-open rods from engine brackets.
Verify hold-open rods are fully extensed.
(2)Clean telescoping rod sections with a clean lint-free cloth moistened in a SPOP 208 solvent (Ref. 70-00-00, P. Block 201).
(3)Remove minor scratches, nicks, and other surface imperfections from telescoping rod sections with a crocus abrasive cloth.
Repeat step (2).

C. Lubricate Thrust Reverser Door Hold-Open Rods (Ref. Fig. 301)
(1)Coat the extended telescoping sections of the hold-open rods with Material No.P06-004.
(2)Retract telescoping rod section and attach hold-open rods to their retention clips.

D. Close-Up
(1)Remove support tool 98A7110325000 from pylon and thrust reverser door.
(2)Close thrust reverser doors (Ref. 71-13-00, P. Block 301)
Remove safety clips and tags and close circuit breakers.



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Extended Thrust Reverser Door Hold-Open Rods
Figure 301

THRUST REVERSER DOOR HOLD-OPEN RODS - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
C. Material No.P03-001	Oils (Ref. 70-00-00)
D. 98A71103250000	Sleeve - Cowl Door Opening Actuator
Referenced Procedure - 71-13-00, P. Block 301	Cowl Doors

2. Procedure

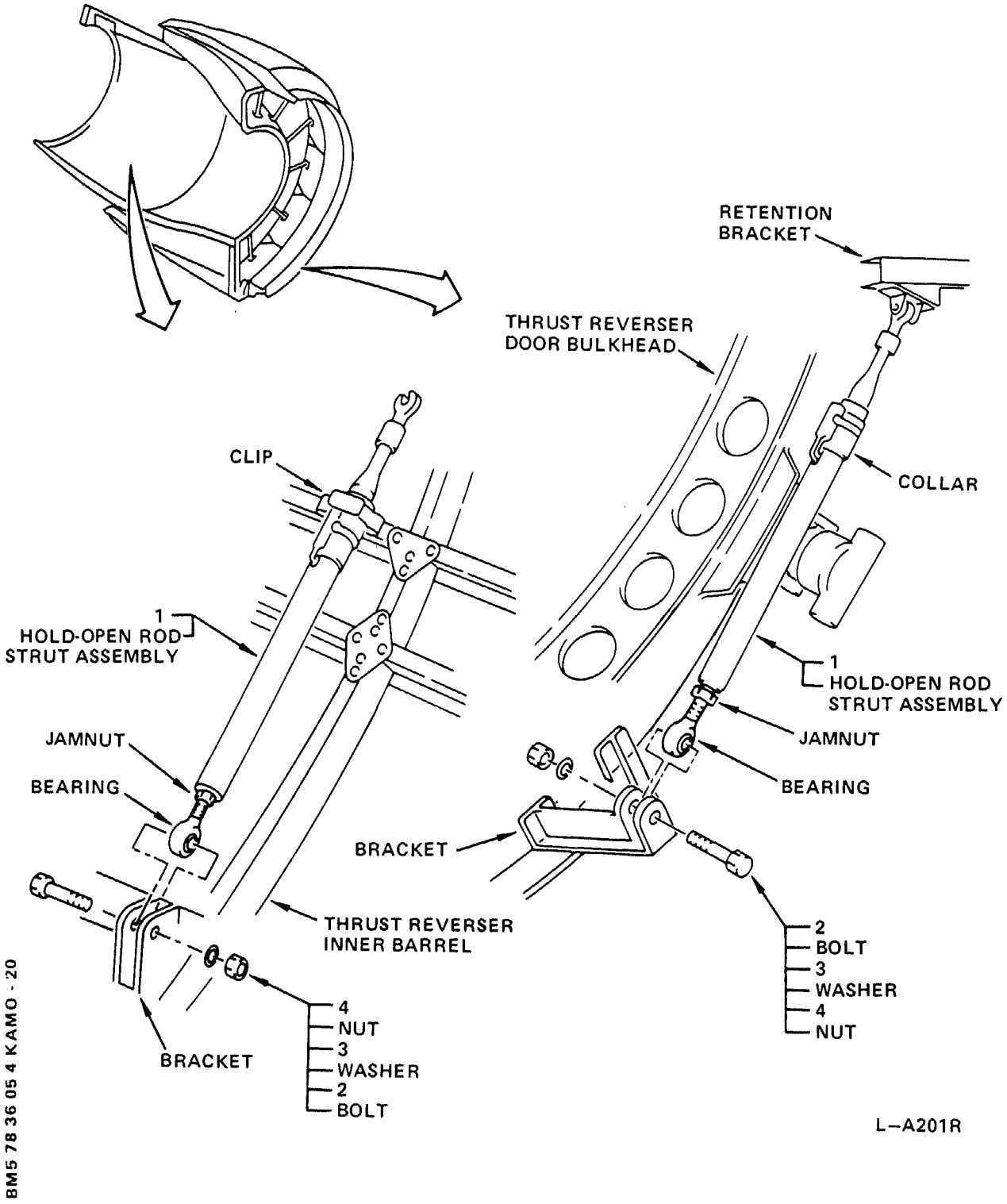
A. Job Set-Up
(1)Open, safety and tag circuit breakers for the appropriate engine and open fan cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.

B. Removal (Ref. Fig. 401)
(1)Remove forward thrust reverser hold-open rod.
(a)Remove bolt, washer, and nut attaching rod to thrust reverser door bulkhead.
(b)Pull collar down to release hold-open rod locking pin from bracket and remove rod.
(2)Remove aft thrust reverser hold-open rod.
(a)Open thrust reverser cowl door (Ref. 71-13-00, P. Block 301).
(b)Install thrust reverser door opening actuator sleeve 98A71103250000 to pylon and door.
(c)Remove bolt, washer, and nut attaching rod to inner barrel of thrust reverser.
(d)Release hold-open rod from clip and remove rod.

C. Installation (Ref. Fig. 401)
(1)Install forward reverser hold-open rod strut assembly (1).
(a)Attach hold-open rod to thrust reverser door bulkhead bracket with bolt (2) threads lubricated with Material No.P03-001, washer (3), and nut (4).
(b)Loosen self-locking jamnut on bearing and rotate rod to increase or decrease length as required. Threaded portion of bearing is not to extend more than 0.50 in. (12.70 mm) beyond rod.
(c)TORQUE jamnut to between 100 and 140 lbf. in. (1.13 and 1.58 m. daN.).
(d)Attach upper end of hold-open rod to retention bracket on thrust reverser door bulkhead. Push collar up until locking pin engages.
(2)Install aft thrust reverser hold-open rod strut assembly (1).
(a)Attach hold-open rod to thrust reverser door inner barrel with bolt (2) threads lubricated with Material No.P03-001, washer (3), and nut (4).
(b)Loosen self-locking jamnut on bearing and rotate rod to increase or decrease length, as required. Threaded portion of bearing is not to extend more than 0.50 in. (12.70 mm) beyond rod.

(c)TORQUE jamnut to between 100 and 140 lbf. in. (1.13 and 1.58 m. daN.).
(d)Attach upper end of rod to retention clip on thrust reverser inner barrel.
(3)Remove thrust reverser door opening actuator sleeve.

D. Close-Up
(1)Remove access platform.
(2)Make certain that working area is clean and clear of tools, and miscellaneous items of equipment.
(3)Remove safety clips and tags and close circuit breakers and close thrust reverser and fan cowl doors (Ref. 71-13-00, P. Block 301).



Thrust Reverser Door Hold-Open Rods
Figure 401

PRECOOLER SUPPLY DUCT - REMOVAL/INSTALLATION

1. Equipment and Materials

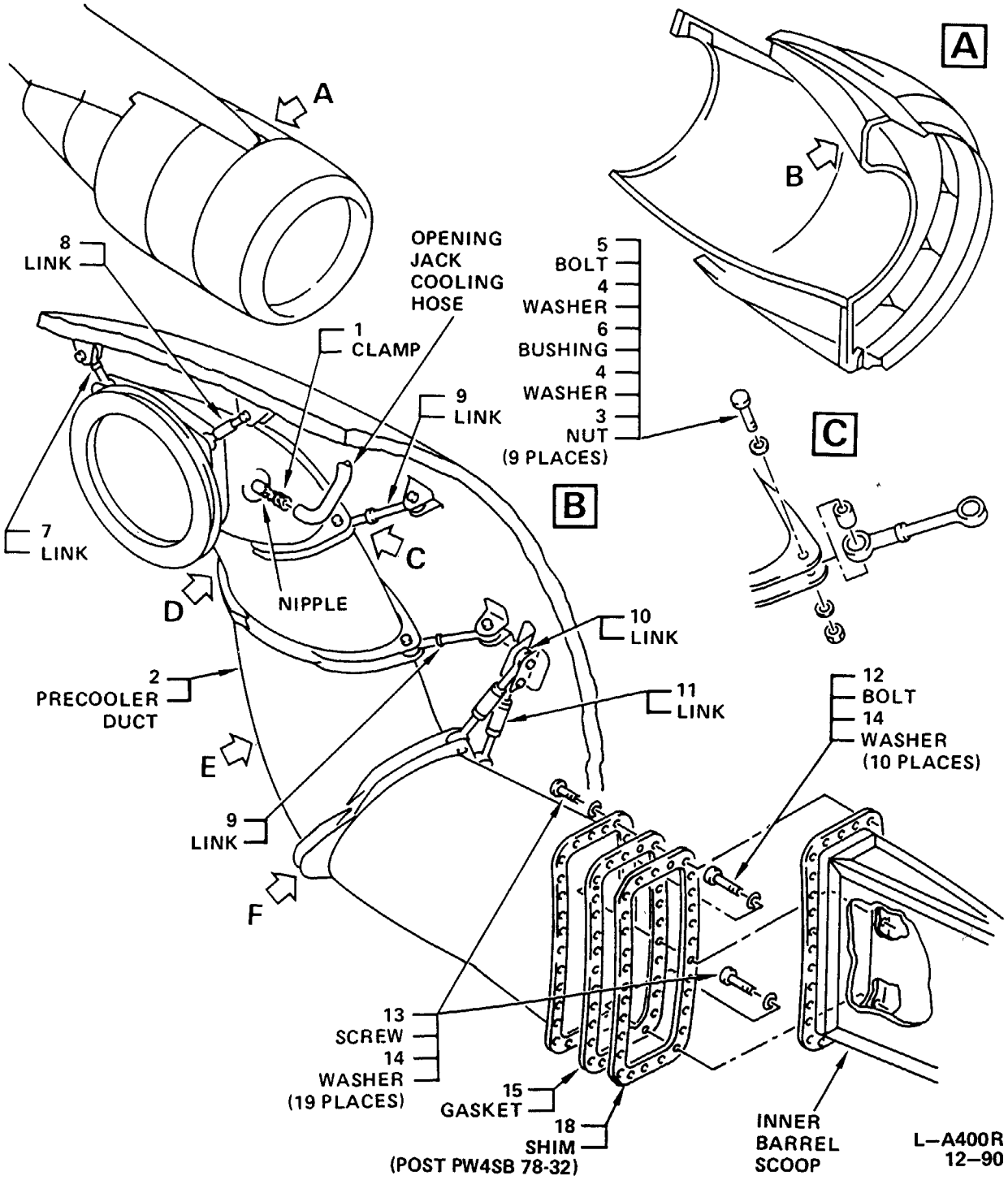
ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B. RSE1120	Tool, Alignment
C.	Gasket
D.	Corrosion Resistant Steel Lockwire (MS20995N32) (Ref. 70-00-00)
E.	Torque Wrench
Referenced Procedures	
- 36-11-16, P. Block 601	Fan Air Valve
- 71-13-00, P. Block 301	Cowl Doors

2. Procedure

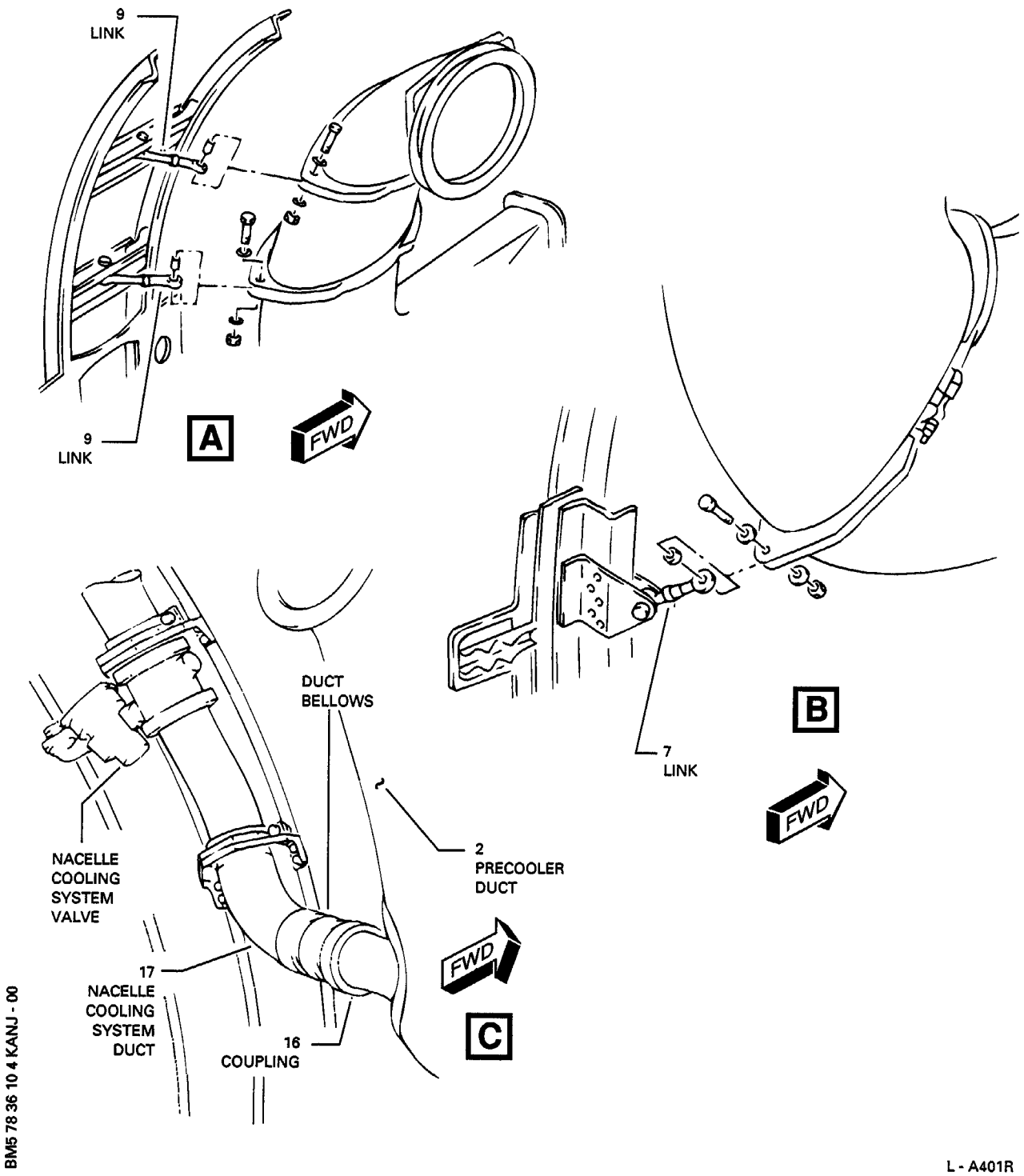
A. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open the thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).

B. Removal (Post SB PW4 NAC 78-32) (Ref. Fig. 401)
(1)Remove coupling (16) which connects nacelle cooling system duct (17) to precooler duct (2).
(2)Remove hose clamp (1) and disconnect thrust reverser door opening jack cooling hose from precooler duct (2).
(3)Remove nuts (3), washers (4), bolts (5) and bushings (6) to disconnect links (7), (8), (9), (10) and (11) from precooler duct (2).
(4)Support precooler duct (2) and remove bolts (12), screws (13) and washers (14) attaching duct to inner barrel scoop.
(5)Remove precooler duct (2) from thrust reverser.
(6)Remove and discard gasket (15).

C. Installation (Post SB PW4 NAC 78-32) (Ref. Fig. 401, 402)
(1)Attach precooler duct (2), peel shim (18) and gasket (15) to inner barrel scoop with 10 bolts (12) and washers (14) and 19 screws (13) and washers (14). Temporarily tighten bolts and screws handtight.
(2)Connect links (7), (8), (9), (10) and (11), to precooler duct (2) with bushings (6), bolts (5), washers (4) and nuts (3).
NOTE : Position one washer under bolthead and one under nut.
(3)TORQUE nuts (3) to between 50 and 70 lbf.in. (0.57 and 0.79 m.daN).
(4)Connect thrust reverser door opening jack cooling hose to precooler duct (2) nipple with hose clamp (1).
TORQUE screw on hose clamp to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
(5)Install coupling (16) to connect nacelle cooling system duct (17) to precooler duct (2). Do not fully torque coupling bolt at this time.
(6)Align precooler duct (2) (Ref. Fig. 402).
(a)Remove two upper nuts, washers and screws from plates attached to latch support assembly on bottom of thrust reverser door.



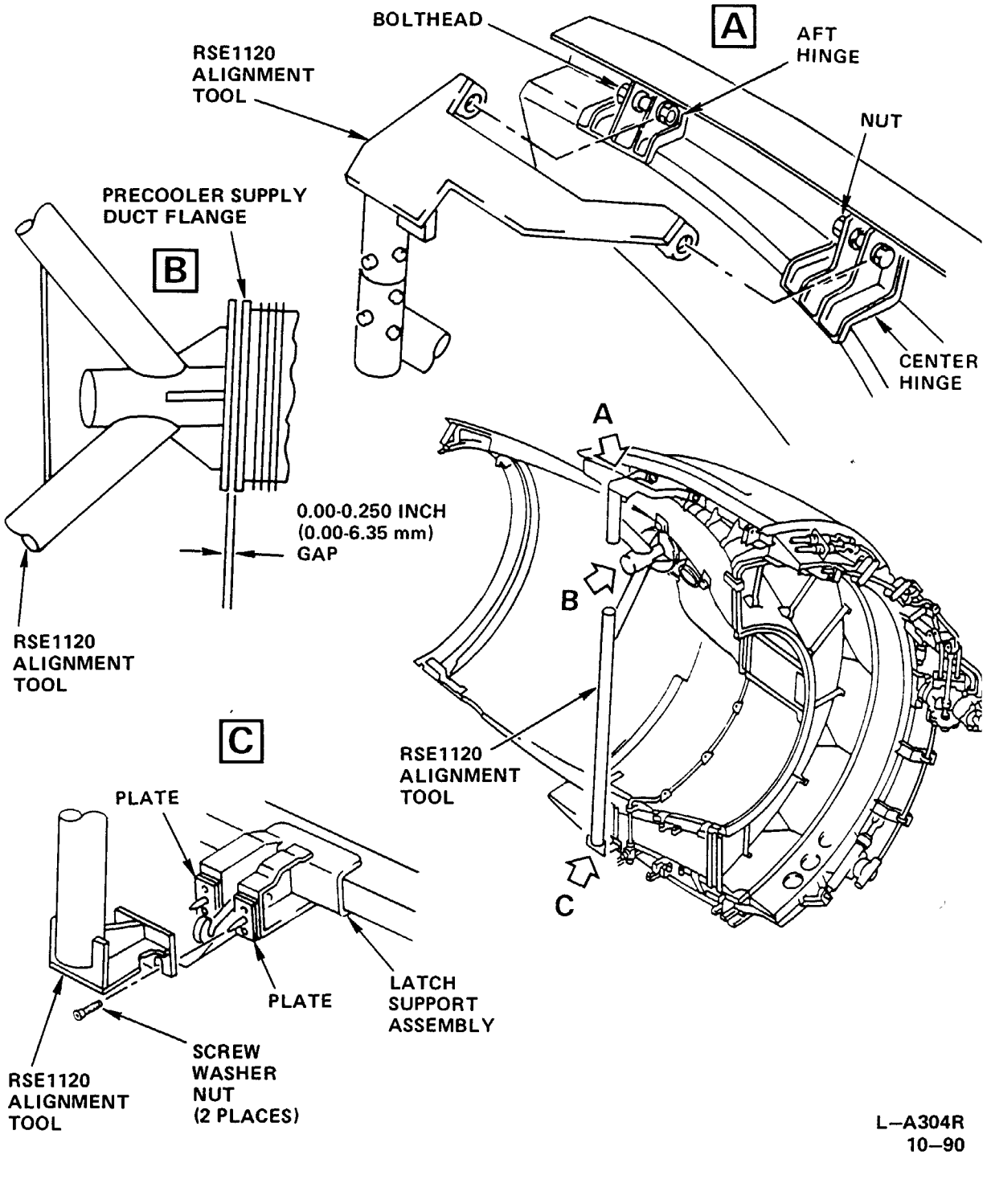
Precooler Supply Duct (Sheet 1/2)
Figure 401



Precooler Supply Duct (Sheet 2/2)
Figure 401

(b)Simultaneously position aft end of RSE1120 Alignment Tool upper arm over thrust reverser door aft hinge bolthead and forward end of alignment tool upper arm over center hinge nut.
(c)Align slots in plate on bottom of alignment tool with two upper holes in latch support assembly plates on bottom of thrust reverser door and reinstall two screws, washers and nuts handtight.
(d)Secure top of alignment tool to aft hinge with clamp.
(e)Align outer edge of alignment tool circular plate with outer edge of precooler duct flange and check for 0-0.250 in. (0-6.350 mm) constant gap between plate and flange.
(f)Adjust duct links to obtain 0-0.250 in. (0-6.350 mm) constant gap between alignment tool circular plate and precooler duct flange.
(g)TORQUE link jamnuts to between 100 and 140 lbf.in. (1.13 and 1.58 m.daN).
(h)Inspect and check gap of 0-0.250 in. (0-6.350 mm).
If gap falls within limits, TORQUE attaching bolts to between 20 and 25 lbf.in. (0.22 and 0.28 m.daN) and wirelock support link jamnuts (proceed to step (k)).
(i)If gap exceeds limits, remove gasket and peel shim (Post SB PW4 NAC 78-32) and peel shim plies as necessary to meet gap limits. Re-install shim and gasket with attaching bolts and TORQUE bolts to between 20 and 25 lbf.in. (0.22 and 0.28 m.daN).
(j)Install support links with jamnuts. TORQUE jamnuts to between 100 and 140 lbf.in. (1.13 and 1.58 m.daN) and wirelock.
(k)Remove clamp securing top of alignment tool.
(l)Remove two nuts, washers and screws attaching bottom of alignment tool to latch support plates on bottom of thrust reverser door and remove tool.
(m)Reinstall two screws, washers and nuts in latch support assembly plates on bottom of thrust reverser door and TORQUE nuts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
(n)Adjust nacelle cooling duct (17) to eliminate preload and to keep 1.375 in. (34.9 mm) distance between the nacelle cooling duct bellows and the inner barrel structure.
(o)TORQUE V-band coupling (16) attaching nacelle cooling system duct (17) to precooler duct (2) to 50 lbf.in. (0.56 m.daN) net torque.

D. Close-Up
(1)Perform an inspection/check of the seal assembly compression (Ref. 36-11-16, P. Block 601).
(2)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(3)Close thrust reverser cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.



Precooler Duct Alignment
Figure 402